	SPIRIT Summary Table - UEPH	Maximum points possible	Mandatory Points	Proposed/Earned Points	
PAR	**FEATURE**				**REMARKS**
NOTE: SEE SPIRIT TEXT FOR FULL DESCRIPTION OF REQUIREMENTS FOR EACH ITEM.					
COMPLIANCE IS REQUIRED IF "R" OR A NUMBER GREATER THAN ZERO APPEARS IN THE					
MANDATORY POINTS COLUMN					
1.R1	Sediment/Erosion Control Plan	R	R	R	Project requirement
1.C1	Avoid undesirable sites	1			
	Site adjacencies/compatibility	1	1	1	Site meets criteria
1.C2	Increase density	1	1	1	Site meets criteria
	Minimize new infrastructure	1	1	1	Site meets criteria
1.C3	Brownfield	1			
1.C4	Proximity to transit system	1	0	0	N/A
	Bike racks & showers	1	1	1	Project requirement
	Proximity to alternative fuel station	1	0	0	N/A
	Parking capacity, carpool parking	1	0	0	N/A
1.C5	Limited site disturbance, restoration	1			
	Reduced footprint	1	1	1	Site AT/FP rqmts meet criteria
1.C6	Stormwater runoff rate	1	1	1	Project requirement
	Stormwater treatment	1			
1.C7	Reduce site heat islands	1			
	Reduce roof heat islands	1	0	0	Conflict with project rqmts
1.C8	Reduce light pollution	1	1	1	Project requirement
1.C9	optimize site features	1			
1.C10	Cluster facilities	1	1	1	Site meets criteria
	Mitigate offsite impacts	1			
1.C11	Site Ecology	1	1	1	RFP Requirement (Spec 01355)
2.C1	High efficiency irrigation/recycle site water	1			
	no irrigation	1	0	0	Conflict w/project requirements
2.C2	Innovative wastewater technologies	1			
2.C3	20% Water use reduction	1			
	30% Water use reduction	1			
3.R1	Building commissioning	R	R	R	Project requirement
3.R2	Minimum energy performance	R	R	R	Project requirements
3.R3	CFC Reduction	R	R	R	Project requirement
3.C1	Optimize energy performance	20			
3.C2	5% Onsite renewable energy	1			
	10% onsite renewable energy	2			
	15% onsite renewable energy	3			
	20% onsite renewable energy	4			
3.C3	Additional commissioning	1			
3.C5	Measurement and verification	1			
3.C6	Green power	1	0	0	N/A
3.C7	Distributed generation	1			
4.R1	Storage & collection of recyclables	R	R	R	Project requirement
4.C1	Building reuse	3	0	0	N/A
4.C2	Reduce construction waste	1			
	Reduce construction waste addl	1			
4.C3	Salvage/reused materials	1			
	Salvage/reused materials addl	1			
4.C4	Materials recycled content	1			
	Addl materials recycled content	1			
4.C5	Regionally manufactured materials	1			
	Regionally extracted materials	1			
4.C6	Rapidly renewable materials	1			

4.C7	Certified wood	1			
5.R1	Minimum IAQ performance	R	R	R	Project requirement
5.R2	Environmental tobacco smoke	R	R	R	Project requirement
5.C1	IAQ monitoring	1			
5.C2	Increase ventilation effectiveness	1	1	1	Project requirement
5.C3	SMACNA/absorptive mtls/filtration	1	1	1	Project requirement
	Flushout/baseline IAQ test	1	1	1	Project requirement
5.C4	Adhesive/sealant VOC	1			
	Green Seal paints & coatings	1	1	1	Project requirement
	CRI Green Label carpet	1	0	0	N/A No carpet in facility
	No urea/formaldehyde resins	1			
5.C5	Indoor pollutant source control	1			
5.C6	Operable windows, perimeter light controls	1	1	1	Project requirement
	Non-perimeter controls	1	1	1	
5.C7	ASHRAE thermal comfort stds	1			
	Temperature/humidity monitoring	1			
5.C8	75% daylighting	1			No skylights allowed
	90% outdoor view	1			
5.C9	Noise control	1	1	1	Project requirement
5.C10	IAQ management plan	1			
6.C1	Team leader experience	1			
	Train team	1	1	1	Project requirement
	Identify project goals	1			
	Charettes	1			If done, must be before design proceeds
	Resolve tradeoffs	2			
	Document results	1			
7.C1	Develop O&M plan	2			
	Durable materials	1	1	1	Project requirement
7.C2	Quality indoor environment	1	1	1	Project requirement
	Functional work environment	1	0	0	N/A - Not a work environment
	Healthy work environment	1	0	0	N/A - Not a work environment
8.C1	Determine functional life	1	1	1	25 yr
	Determine building life	1			
8.C2	Design for future uses	1			
	Minimize building size/recyclability	1			
	TOTAL	100			

	SPIRIT Summary Table - COF	Maximum points possible	Mandatory Points	Proposed/Earned Points			
PAR	**FEATURE**				**REMARKS**		
NOTE: SEE SPIRIT TEXT FOR FULL DESCRIPTION OF REQUIREMENTS FOR EACH ITEM.							
COMPLIANCE IS REQUIRED IF "R" OR A NUMBER GREATER THAN ZERO APPEARS IN THE							
MANDATORY POINTS COLUMN							
1.R1	Sediment/Erosion Control Plan	R	R	R	Project requirement		
1.C1	Avoid undesirable sites	1					
	Site adjacencies/compatibility	1	1	1	Site meets criteria		
1.C2	Increase density	1	1	1	Site meets criteria		
	Minimize new infrastructure	1	1	1	Site meets criteria		
1.C3	Brownfield	1					
1.C4	Proximity to transit system	1	0	0	N/A		
	Bike racks & showers	1	1	1	Project requirement		
	Proximity to alternative fuel station	1	0	0	N/A		
	Parking capacity, carpool parking	1	0	0	N/A		
1.C5	Limited site disturbance , restoration	1					
	Reduced footprint	1	1	1	Site AT/FP rqmts meet criteria		
1.C6	Stormwater runoff rate	1	1	1	Project requirement		
	Stormwater treatment	1					
1.C7	Reduce site heat islands	1					
	Reduce roof heat islands	1	0	0	Conflict with project rqmts		
1.C8	Reduce light pollution	1	1	1	Project requirement		
1.C9	optimize site features	1					
1.C10	Cluster facilities	1	1	1	Site meets criteria		
	Mitigate offsite impacts	1					
1.C11	Site Ecology	1	1	1	RFP Requirement (Spec 01355)		
2.C1	High efficiency irrigation/recycle site water	1					
	no irrigation	1	0	0	Conflict w/project requirements		
2.C2	Innovative wastewater technologies	1					
2.C3	20% Water use reduction	1					
	30% Water use reduction	1					
3.R1	Building commissioning	R	R	R	Project requirement		
3.R2	Minimum energy performance	R	R	R	Project requirement		
3.R3	CFC Reduction	R	R	R	Project requirement		
3.C1	Optimize energy performance	20					
3.C2	5% Onsite renewable energy	1					
	10% onsite renewable energy	2					
	15% onsite renewable energy	3					
	20% onsite renewable energy	4					
3.C3	Additional commissioning	1					
3.C5	Measurement and verification	1					
3.C6	Green power	1	0	0	N/A		
3.C7	Distributed generation	1					
4.R1	Storage & collection of recyclables	R	R	R	Project requirement		
4.C1	Building reuse	3	0	0	N/A		
4.C2	Reduce construction waste	1					
	Reduce construction waste addl	1					
4.C3	Salvage/reused materials	1					
	Salvage/reused materials addl	1					
4.C4	Materials recycled content	1					
	Addl materials recycled content	1					
4.C5	Regionally manufactured materials	1					
	Regionally extracted materials	1					
4.C6	Rapidly renewable materials	1					
4.C7	Certified wood	1					
5.R1	Minimum IAQ performance	R	R	R	Project requirement		
5.R2	Environmental tobacco smoke	R	R	R	Project requirement		

5.C1	IAQ monitoring	1					
5.C2	Increase ventilation effectiveness	1	1	1	Project requirement		
5.C3	SMACNA/absorptive mtls/filtration	1	1	1	Project requirement		
	Flushout/baseline IAQ test	1	1	1	Project requirement		
5.C4	Adhesive/sealant VOC	1					
	Green Seal paints & coatings	1	1	1	Project requirement		
	CRI Green Label carpet	1	0	0	N/A - No carpet at facility		
	No urea/formaldehyde resins	1					
5.C5	Indoor pollutant source control	1					
5.C6	Operable windows, perimeter light controls	1					
	Non-perimeter controls	1					
5.C7	ASHRAE thermal comfort stds	1					
	Temperature/humidity monitoring	1					
5.C8	75% daylighting	1			No skylights allowed		
	90% outdoor view	1					
5.C9	Noise control	1	1	1	Project requirement		
5.C10	IAQ management plan	1					
6.C1	Team leader experience	1					
	Train team	1	1	1	Project requirement		
	Identify project goals	1					
	Charettes	1			If done, must be before design proceeds		
	Resolve tradeoffs	2					
	Document results	1					
7.C1	Develop O&M plan	2					
	Durable materials	1	1	1	Project requirement		
7.C2	Quality indoor environment	1	1	1	Project requirement		
	Functional work environment	1	1	1	Project requirement		
	Healthy work environment	1	1	1	Project requirement		
8.C1	Determine functional life	1	1	1	25 yr		
	Determine building life	1					
8.C2	Design for future uses	1					
	Minimize building size/recyclability	1					
	TOTAL	100					

	SPIRIT Summary Table - BATTALION HEADQUARTERS	Maximum points possible	Mandatory Points	Proposed/Earned Points	
PAR	**FEATURE**				**REMARKS**
NOTE: SEE SPIRIT TEXT FOR FULL DESCRIPTION OF REQUIREMENTS FOR EACH ITEM.					
COMPLIANCE IS REQUIRED IF "R" OR A NUMBER GREATER THAN ZERO APPEARS IN THE					
MANDATORY POINTS COLUMN					
1.R1	Sediment/Erosion Control Plan	R	R	R	Project requirement
1.C1	Avoid undesirable sites	1			
	Site adjacencies/compatibility	1	1	1	Site meets criteria
1.C2	Increase density	1	1	1	Site meets criteria
	Minimize new infrastructure	1	1	1	Site meets criteria
1.C3	Brownfield	1			
1.C4	Proximity to transit system	1	0	0	N/A
	Bike racks & showers	1	1	1	Project requirement
	Proximity to alternative fuel station	1	0	0	N/A
	Parking capacity, carpool parking	1	0	0	N/A
1.C5	Limited site disturbance , restoration	1			
	Reduced footprint	1	1	1	Site AT/FP rqmts meet criteria
1.C6	Stormwater runoff rate	1	1	1	Project requirement
	Stormwater treatment	1			
1.C7	Reduce site heat islands	1			
	Reduce roof heat islands	1	0	0	Conflict with project rqmts
1.C8	Reduce light pollution	1	1	1	Project requirement
1.C9	optimize site features	1			
1.C10	Cluster facilities	1	1	1	Site meets criteria
	Mitigate offsite impacts	1			
1.C11	Site Ecology	1	1	1	RFP Requirement (Spec 01355)
2.C1	High efficiency irrigation/recycle site water	1			
	no irrigation	1	0	0	Conflict w/project requirements
2.C2	Innovative wastewater technologies	1			
2.C3	20% Water use reduction	1			
	30% Water use reduction	1			
3.R1	Building commissioning	R	R	R	Project requirement
3.R2	Minimum energy performance	R	R	R	Project requirement
3.R3	CFC Reduction	R	R	R	Project requirement
3.C1	Optimize energy performance	20			
3.C2	5% Onsite renewable energy	1			
	10% onsite renewable energy	2			
	15% onsite renewable energy	3			
	20% onsite renewable energy	4			
3.C3	Additional commissioning	1			
3.C5	Measurement and verification	1			
3.C6	Green power	1	0	0	N/A
3.C7	Distributed generation	1			
4.R1	Storage & collection of recyclables	R	R	R	Project requirement
4.C1	Building reuse	3	0	0	N/A
4.C2	Reduce construction waste	1			
	Reduce construction waste addl	1			
4.C3	Salvage/reused materials	1			
	Salvage/reused materials addl	1			
4.C4	Materials recycled content	1			
	Addl materials recycled content	1			
4.C5	Regionally manufactured materials	1			
	Regionally extracted materials	1			

4.C6	Rapidly renewable materials	1			
4.C7	Certified wood	1			
5.R1	Minimum IAQ performance	R	R	R	Project requirement
5.R2	Environmental tobacco smoke	R	R	R	Project requirement
5.C1	IAQ monitoring	1			
5.C2	Increase ventilation effectiveness	1	1	1	Project requirement
5.C3	SMACNA/absorptive mtls/filtration	1	1	1	Project requirement
	Flushout/baseline IAQ test	1	1	1	Project requirement
5.C4	Adhesive/sealant VOC	1			
	Green Seal paints & coatings	1	1	1	Project requirement
	CRI Green Label carpet	1	1	1	Project requirement
	No urea/formaldehyde resins	1			
5.C5	Indoor pollutant source control	1			
5.C6	Operable windows, perimeter light controls	1			
	Non-perimeter controls	1			
5.C7	ASHRAE thermal comfort stds	1			
	Temperature/humidity monitoring	1			
5.C8	75% daylighting	1			No skylights allowed
	90% outdoor view	1			
5.C9	Noise control	1	1	1	Project requirement
5.C10	IAQ management plan	1			
6.C1	Team leader experience	1			
	Train team	1	1	1	Project requirement
	Identify project goals	1			
	Charettes	1			If done, must be before design proceeds
	Resolve tradeoffs	2			
	Document results	1			
7.C1	Develop O&M plan	2			
	Durable materials	1	1	1	Project requirement
7.C2	Quality indoor environment	1	1	1	Project requirement
	Functional work environment	1	1	1	Project requirement
	Healthy work environment	1	1	1	Project requirement
8.C1	Determine functional life	1	1	1	25 yr
	Determine building life	1			
8.C2	Design for future uses	1			
	Minimize building size	1			
	TOTAL	100			

	SPIRIT Summary Table - BRIGADE HEADQUARTERS	Maximum points possible	Mandatory Points	Proposed/Earned Points	
PAR	**FEATURE**				**REMARKS**
NOTE: SEE SPIRIT TEXT FOR FULL DESCRIPTION OF REQUIREMENTS FOR EACH ITEM.					
COMPLIANCE IS REQUIRED IF "R" OR A NUMBER GREATER THAN ZERO APPEARS IN THE					
MANDATORY POINTS COLUMN					
1.R1	Sediment/Erosion Control Plan	R	R	R	Project requirement
1.C1	Avoid undesirable sites	1			
	Site adjacencies/compatibility	1	1	1	Site meets criteria
1.C2	Increase density	1	1	1	Site meets criteria
	Minimize new infrastructure	1	1	1	Site meets criteria
1.C3	Brownfield	1			
1.C4	Proximity to transit system	1	0	0	N/A
	Bike racks & showers	1	1	1	Project requirement
	Proximity to alternative fuel station	1	0	0	N/A
	Parking capacity, carpool parking	1	0	0	N/A
1.C5	Limited site disturbance , restoration	1			
	Reduced footprint	1	1	1	Site AT/FP rqmts meet criteria
1.C6	Stormwater runoff rate	1	1	1	Project requirement
	Stormwater treatment	1			
1.C7	Reduce site heat islands	1			
	Reduce roof heat islands	1	0	0	Conflict with project rqmts
1.C8	Reduce light pollution	1	1	1	Project requirement
1.C9	optimize site features	1			
1.C10	Cluster facilities	1	1	1	Site meets criteria
	Mitigate offsite impacts	1			
1.C11	Site Ecology	1	1	1	RFP Requirement (Spec 01355)
2.C1	High efficiency irrigation/recycle site water	1			
	no irrigation	1	0	0	Conflict w/project requirements
2.C2	Innovative wastewater technologies	1			
2.C3	20% Water use reduction	1			
	30% Water use reduction	1			
3.R1	Building commissioning	R	R	R	Project requirement
3.R2	Minimum energy performance	R	R	R	Project requirement
3.R3	CFC Reduction	R	R	R	Project requirement
3.C1	Optimize energy performance	20			
3.C2	5% Onsite renewable energy	1			
	10% onsite renewable energy	2			
	15% onsite renewable energy	3			
	20% onsite renewable energy	4			
3.C3	Additional commissioning	1			
3.C5	Measurement and verification	1			
3.C6	Green power	1	0	0	N/A
3.C7	Distributed generation	1			
4.R1	Storage & collection of recyclables	R	R	R	Project requirement
4.C1	Building reuse	3	0	0	N/A
4.C2	Reduce construction waste	1			
	Reduce construction waste addl	1			
4.C3	Salvage/reused materials	1			
	Salvage/reused materials addl	1			
4.C4	Materials recycled content	1			

	Addl materials recycled content	1			
4.C5	Regionally manufactured materials	1			
	Regionally extracted materials	1			
4.C6	Rapidly renewable materials	1			
4.C7	Certified wood	1			
5.R1	Minimum IAQ performance	R	R	R	Project requirement
5.R2	Environmental tobacco smoke	R	R	R	Project requirement
5.C1	IAQ monitoring	1			
5.C2	Increase ventilation effectiveness	1	1	1	Project requirement
5.C3	SMACNA/absorptive mtls/filtration	1	1	1	Project requirement
	Flushout/baseline IAQ test	1	1	1	Project requirement
5.C4	Adhesive/sealant VOC	1			
	Green Seal paints & coatings	1	1	1	Project requirement
	CRI Green Label carpet	1	1	1	Project requirement
	No urea/formaldehyde resins	1			
5.C5	Indoor pollutant source control	1			
5.C6	Operable windows, perimeter light controls	1			
	Non-perimeter controls	1			
5.C7	ASHRAE thermal comfort stds	1			
	Temperature/humidity monitoring	1			
5.C8	75% daylighting	1			No skylights allowed
	90% outdoor view	1			
5.C9	Noise control	1	1	1	Project requirement
5.C10	IAQ management plan	1			
6.C1	Team leader experience	1			
	Train team	1	1	1	Project requirement
	Identify project goals	1			
	Charettes	1			If done, must be before design proceeds
	Resolve tradeoffs	2			
	Document results	1			
7.C1	Develop O&M plan	2			
	Durable materials	1	1	1	Project requirement
7.C2	Quality indoor environment	1	1	1	Project requirement
	Functional work environment	1	1	1	Project requirement
	Healthy work environment	1	1	1	Project requirement
8.C1	Determine functional life	1	1		25 yr
	Determine building life	1			
8.C2	Design for future uses	1			
	Minimize building size/recyclability	1			
	TOTAL	100			

	SPIRIT Summary Table - MP STATION	Maximum points possible	Mandatory Points	Proposed/Earned Points	
PAR	**FEATURE**				**REMARKS**
NOTE: SEE SPIRIT TEXT FOR FULL DESCRIPTION OF REQUIREMENTS FOR EACH ITEM.					
COMPLIANCE IS REQUIRED IF "R" OR A NUMBER GREATER THAN ZERO APPEARS IN THE					
MANDATORY POINTS COLUMN					
1.R1	Sediment/Erosion Control Plan	R	R	R	Project requirement
1.C1	Avoid undesirable sites	1			
	Site adjacencies/compatibility	1	1	1	Site meets criteria
1.C2	Increase density	1	1	1	Site meets criteria
	Minimize new infrastructure	1	1	1	Site meets criteria
1.C3	Brownfield	1			
1.C4	Proximity to transit system	1	0	0	N/A
	Bike racks & showers	1	1	1	Project requirement
	Proximity to alternative fuel station	1	0	0	N/A
	Parking capacity, carpool parking	1	0	0	N/A
1.C5	Limited site disturbance , restoration	1	0	0	
	Reduced footprint	1	1	1	Site AT/FP rqmts meet criteria
1.C6	Stormwater runoff rate	1	1	1	Project requirement
	Stormwater treatment	1	0	0	Not required
1.C7	Reduce site heat islands	1			
	Reduce roof heat islands	1	0	0	Conflict with project rqmts
1.C8	Reduce light pollution	1	1	1	Project requirement
1.C9	optimize site features	1			
1.C10	Cluster facilities	1	1	1	Site meets criteria
	Mitigate offsite impacts	1			
1.C11	Site Ecology	1	1	1	RFP Requirement (Spec 01355)
2.C1	High efficiecy irrigation/recycle site water	1			
	no irrigation	1	0	0	Conflict w/project requirements
2.C2	Innovative wastewater technologies	1			
2.C3	20% Water use reduction	1			
	30% Water use reduction	1			
3.R1	Building commissioning	R	R	R	Project requirement
3.R2	Minimum energy performance	R	R	R	Project requirement
3.R3	CFC Reduction	R	R	R	Project requirement
3.C1	Optimize energy performance	20			
3.C2	5% Onsite renewable energy	1			
	10% onsite renewable energy	2			
	15% onsite renewable energy	3			
	20% onsite renewable energy	4			
3.C3	Additional commissioning	1			
3.C5	Measurement and verification	1			
3.C6	Green power	1	0	0	N/A
3.C7	Distributed generation	1			
4.R1	Storage & collection of recyclables	R	R	R	Project requirement
4.C1	Building reuse	3	0	0	N/A
4.C2	Reduce construction waste	1			
	Reduce construction waste addl	1			
4.C3	Salvage/reused materials	1			

	Salvage/reused materials addl	1			
4.C4	Materials recycled content	1			
	Addl materials recycled content	1			
4.C5	Regionally manufactured materials	1			
	Regionally extracted materials	1			
4.C6	Rapidly renewable materials	1			
4.C7	Certified wood	1			
5.R1	Minimum IAQ performance	R	R	R	Project requirement
5.R2	Environmental tobacco smoke	R	R	R	Project requirement
5.C1	IAQ monitoring	1			
5.C2	Increase ventilation effectiveness	1	1	1	Project requirement
5.C3	SMACNA/absorptive mtls/filtration	1	1	1	Project requirement
	Flushout/baseline IAQ test	1	1	1	Project requirement
5.C4	Adhesive/sealant VOC	1			
	Green Seal paints & coatings	1	1	1	Project requirement
	CRI Green Label carpet	1	1	1	Project requirement
	No urea/formaldehyde resins	1			
5.C5	Indoor pollutant source control	1			
5.C6	Operable windows, perimeter light controls	1	0	0	Conflict with project rqmts
	Non-perimeter controls	1	1	1	
5.C7	ASHRAE thermal comfort stds	1			
	Temperature/humidity monitoring	1			
5.C8	75% daylighting	1			No skylights allowed
	90% outdoor view	1	0	0	Conflict with project rqmts
5.C9	Noise control	1	1	1	Project requirement
5.C10	IAQ management plan	1			
6.C1	Team leader experience	1			
	Train team	1	1	1	Project requirement
	Identify project goals	1			
	Charettes	1			If done, must be before design proceeds
	Resolve tradeoffs	2			
	Document results	1			
7.C1	Develop O&M plan	2			
	Durable materials	1	1	1	Project requirement
7.C2	Quality indoor environment	1	1	1	Project requirement
	Functional work environment	1	1	1	Project requirement
	Healthy work environment	1	1	1	Project requirement
8.C1	Determine functional life	1	1	1	25 yr
	Determine building life	1			
8.C2	Design for future uses	1			
	Minimize building size/recyclability	1			
	TOTAL	100			

APPENDIX I
WARRANTY FOR ROOF SYSTEM

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR ROOF SYSTEM

FACILITY DESCRIPTION_____

BUILDING NUMBER:_____

CORPS OF ENGINEERS CONTRACT NUMBER:_____

CONTRACTOR

CONTRACTOR:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION AGENT:_____

ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE NUMBER:_____

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
ROOF SYSTEM
(continued)

THE ROOF SYSTEM INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY _____ FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE. THE ROOF SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: THE ENTIRE ROOFING SYSTEM, SHINGLES, MEMBRANE, FASTENERS, CONNECTORS, ROOF SECUREMENT COMPONENTS, AND ASSEMBLIES. IN ADDITION, THE SYSTEM FINISHES, SLIP SHEET, INSULATION, VAPOR RETARDER, ALL ACCESSORIES, COMPONENTS, AND TRIM AND ALL CONNECTIONS ARE INCLUDED. THIS INCLUDES ROOF PENETRATION ITEMS SUCH AS VENTS, CURBS, GUTTERS AND DOWNSPOUTS; EAVES, RIDGE, HIP, VALLEY, RAKE, GABLE, WALL, OR OTHER ROOF SYSTEM FLASHINGS INSTALLED TO PROVIDE A WEATHERTIGHT ROOF SYSTEM.

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE, AND LEAKAGE ASSOCIATED WITH THE ROOF SYSTEM COVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON _____ AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
ROOF SYSTEM
(continued)

THE CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND/OR INSTALLER OF THE ROOF SYSTEM, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY EXAMPLE.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE ROOF SYSTEM DUE TO ACTIONS BY THE OWNER TO INHIBIT FREE DRAINAGE OF WATER FROM THE ROOF AND GUTTERS AND DOWNSPOUTS OR ALLOW PONDING WATER TO COLLECT ON THE ROOF SURFACE. CONTRACTOR'S DESIGN SHALL INSURE FREE DRAINAGE FROM THE ROOF AND NOT ALLOW PONDING WATER.

6. THIS WARRANTY APPLIES TO THE ROOF SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR; AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES.

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
ROOF SYSTEM
(continued)

REPORTS OF LEAKS AND ROOF SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE, BY TELEPHONE OR IN WRITING, FROM EITHER THE OWNER OR CONTRACTING OFFICER. EMERGENCY REPAIRS TO PREVENT FURTHER ROOF LEAKS SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS ROOF SYSTEM WITHIN SEVEN (7) CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE ROOF SYSTEM REPAIRED OR REPLACED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR.

IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED, THE PARTIES SHALL, WITHIN TEN (10) DAYS, JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN TEN (10) DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE (1) NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED, ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT.

A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

APPENDIX J
FORT BRAGG CONTROLS SPECIFICATION GUIDELINES

CONTROLS SPECIFICATIONS GUIDELINES

The purpose of this document is to describe general requirements for the interface of new or renovated facility control systems to the existing Fort Bragg control system. While consideration should always be given to an energy efficient control design, the designer should exercise judgment as to the applicability of the type of central control system described below. For example, a small, isolated building with a single 3-ton split DX system might be most economically controlled with a programmable thermostat. This document is generally intended to serve as a guide for control systems in larger facilities or for groups of smaller facilities where an Energy Management System or central monitoring and control system is warranted.

The requirements are segmented into 2 areas:

- Central Monitoring Interface
- Building Systems Controls

CENTRAL MONITORING INTERFACE

Fort Bragg utilizes a LonMark Building Automation System (BAS) to provide centralized monitoring and control of energy, maintenance, and operation functions.

General Requirements

1. All new building control systems, including Facility Management and Control Systems (FMCS), Energy Management and Control Systems (EMCS), or Direct Digital Control (DDC) Systems, shall be connected to the Ft. Bragg system utilizing a flat, open architecture that utilizes the LonTalk protocol as the common communication protocol between all controlled and controlling devices. The system network shall be an Echelon LON (local operating network) utilizing the LNS network operating system.
2. Field devices and controllers shall have all monitoring and control points mapped to building operations PC (Bldg Ops PC) and Central PC workstations to allow full monitoring and operation of systems.
3. Each Building Ops PC, if required, shall be provided with Graphic User Interface (GUI) software.
4. As a minimum, each Bldg Ops PC and Central PC shall have graphics depicting each major system being controlled (ie: Chiller/Tower, Boiler , AHU, etc.), and an additional graphic providing an overview of the systems. Additional graphic displays will be provided as necessary to provide easy monitoring and operation capability for maintenance and operations personnel. All graphics shall be consistent in appearance with existing graphics.
5. Each Bldg Ops PC and Central PC shall be programmed to trend and alarm key system energy and operating parameters.

BUILDING SYSTEM CONTROLS

The following monitoring/control points and functions should be provided for each major system described below. Note that points and functions listed are minimum requirements; additional DDC point such as AHU valve control, economizer, etc., should be provided as appropriate.

Small AHU / DX Unit (Under 10-tons)

System Points: System Enable/Disable
Space Temperature
Override Pushbutton

Control Function: Scheduled Start/Stop
After-Hours Override

Note: Very small units (under 5 tons) may be grouped.

Large AHU / DX Unit (Over 10-tons)

System Points: System Enable/Disable
System Status
Space Temperature
Supply/Return Air Temperature
Override Pushbutton

Control Function: Scheduled Start/Stop & Reset
After-Hours Override

Small Chiller (Under 100 Tons)

System Points: System Enable/Disable
System Status
Supply/Return Water Temperature
Chilled Water Reset

Control Function: Scheduled Start/Stop or Interlock w/ AHUs
Chilled Water Reset

Large Chiller (Over 100 Tons)

System Points: System Enable/Disable
System Status
Supply/Return Water Temperature
Chilled Water Reset
Chiller Amps
Condenser Water Supply/Return Temperature (If Applicable)

Control Function: Scheduled Start/Stop or Interlock w/ AHUs
Chilled Water Reset

Cooling Tower

System Points: System Enable/Disable

System Status
Fan Speed Control (2-speed or VFD)
Supply/Return Water Temperature

Control Function: Water Temperature Control

Boiler

System Points: System Enable/Disable
System Status
Hot Water Supply Temperature
Hot Water Reset Control

Control Function: Scheduled Enable/Disable or Interlock with AHUs
Hot Water Reset

General and Miscellaneous Points

System Points/Functions: Outdoor Air Temperature
Building Chilled Water Loop Temperature
Walk-in Freezer / Refrigerator Temperatures
Control Air Pressure / Compressor Status
Lighting Control w/ After-hours Override
Indoor Air Quality / CO2 / VOCs

APPENDIX K
ENERGY PROGRAM INPUT SAMPLES

10/5

Simulation type: Reduced year

January - December	**Cooling design to Weekday**	**Start time**	**End time**	**Percentage**	Utilization
		Midnight	7 a.m.	0.0	
		7 a.m.	5 p.m.	100.0	
		5 p.m.	Midnight	0.0	
January - December	**Saturday to Sunday**	**Start time**	**End time**	**Percentage**	Utilization
		Midnight	Midnight	0.0	
Heating Design		**Start time**	**End time**	**Percentage**	Utilization
		Midnight	Midnight	0.0	

Layer	Code	Description	Thickness	Conductivity	Density	Specific Heat	Resistance
1	A0	Outside Surface Resist.					0.33 ft²·hr·°F/Btu
2	A2	4 in. Face Brick	4.00 in.	0.75 Btu/hr·ft·°F	130.00 lb/cu ft	0.22 Btu/lb·°F	
3	B0	Air Space Resistance					0.91 ft²·hr·°F/Btu
4	M58	3/4 in. Plywood Sheathing	0.75 in.	0.07 Btu/hr·ft·°F	34.00 lb/cu ft	0.29 Btu/lb·°F	
5	M72	R13					13.00 ft²·hr·°F/Btu
6	M60	5/8 in. Gypsum Board-horiz	0.63 in.	0.09 Btu/hr·ft·°F	50.00 lb/cu ft	0.26 Btu/lb·°F	
7	E0	Inside Surface Resist.					0.69 ft²·hr·°F/Btu

Lamda = 0.59 Weight = 48.06 lb/ft² U-Value = 0.060 Btu/hr·ft²·°F Alpha = 0.90
Delta = 5 hours Heat Capacity = 10.83 Btu/ft²·lb·°F C-Coefficient = 0.0100 Btu/hr·ft²·°F

Bhq 2nd fl CUSTOM ROOF

Layer	Code	Description	Thickness	Conductivity	Density	Specific Heat	Resistance
1	A0	Outside Surface Resist.					0.33 ft²·hr·°F/Btu
2	M71	EIFS					2.60 ft²·hr·°F/Btu
3	M70	Cement Board, 13mm					0.26 ft²·hr·°F/Btu
4	M72	R13					13.00 ft²·hr·°F/Btu
5	A3	Steel Siding	0.06 in.	26.00 Btu/hr·ft·°F	480.00 lb/cu ft	0.10 Btu/lb·°F	
6	M60	5/8 in. Gypsum Board-horiz	0.63 in.	0.09 Btu/hr·ft·°F	50.00 lb/cu ft	0.26 Btu/lb·°F	
7	E0	Inside Surface Resist.					0.69 ft²·hr·°F/Btu

Lamda = 0.97 Weight = 5.00 lb/ft² U-Value = 0.060 Btu/hr·ft²·°F Alpha = 0.90
Delta = 1 hours Heat Capacity = 0.92 Btu/ft²·lb·°F C-Coefficient = 0.0400 Btu/hr·ft²·°F

Frame Wall, 1" Ins Frame wall, 1" insulation

Layer	Code	Description	Thickness	Conductivity	Density	Specific Heat	Resistance
1	A0	Outside Surface Resist.					0.33 ft²·hr·°F/Btu
2	A1	1 in. Stucco	1.00 in.	0.40 Btu/hr·ft·°F	116.00 lb/cu ft	0.20 Btu/lb·°F	
3	B1	1 in. Insulation	1.00 in.	0.03 Btu/hr·ft·°F	2.00 lb/cu ft	0.20 Btu/lb·°F	
4	B0	Air Space Resistance					0.91 ft²·hr·°F/Btu
5	E1	0.75 in. Plaster	0.75 in.	0.42 Btu/hr·ft·°F	100.00 lb/cu ft	0.20 Btu/lb·°F	
6	E0	Inside Surface Resist.					0.69 ft²·hr·°F/Btu

Lamda = 0.95 Weight = 16.08 lb/ft² U-Value = 0.180 Btu/hr·ft²·°F Alpha = 0.90
Delta = 2 hours Heat Capacity = 3.22 Btu/ft²·lb·°F C-Coefficient = 0.1000 Btu/hr·ft²·°F

Frame Wall, 2" Ins Frame wall, 2" insulation

Lightweight Concrete

Layer Code	Description	Thickness	Conductivity	Density	Specific Heat	Resistance
C1	4 in. LW Concrete	4.00 in.	0.10 Btu/hr·ft·°F	40.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
C2	6 in. LW Concrete	6.00 in.	0.10 Btu/hr·ft·°F	40.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
C3	8 in. LW Concrete	8.00 in.	0.10 Btu/hr·ft·°F	40.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu

Lightweight Concrete Block

Layer Code	Description	Thickness	Conductivity	Density	Specific Heat	Resistance
C4	12 in. LW Concrete	12.00 in.	0.10 Btu/hr·ft·°F	40.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
C12	12 in. LW Concrete Block	12.00 in.	0.44 Btu/hr·ft·°F	38.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
C10	4 in. LW Concrete Block	4.00 in.	0.22 Btu/hr·ft·°F	38.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
C11	8 in. LW Concrete Block	8.00 in.	0.33 Btu/hr·ft·°F	38.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu

Materials

Layer Code	Description	Thickness	Conductivity	Density	Specific Heat	Resistance
None	(Needed For Printing)	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	0.00 ft²·hr·°F/Btu
E2	0.5 in. Slag or Stone	0.50 in.	0.83 Btu/hr·ft·°F	55.00 lb/cu ft	0.40 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M66	1 in. Hardwood Floor Plank	1.00 in.	0.09 Btu/hr·ft·°F	41.20 lb/cu ft	0.39 Btu/lb·°F	0.00 ft²·hr·°F/Btu
B1	1 in. Insulation	1.00 in.	0.03 Btu/hr·ft·°F	2.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M59	1 in. Plywood Flooring	1.00 in.	0.07 Btu/hr·ft·°F	34.00 lb/cu ft	0.29 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M67	1 in. Spray Insulation (horiz)	1.00 in.	0.01 Btu/hr·ft·°F	1.50 lb/cu ft	0.43 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M61	1/2 in. Gypsum Board-horiz	0.50 in.	0.09 Btu/hr·ft·°F	50.00 lb/cu ft	0.26 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M64	1/2 in. Hardwood Flr Plank	0.50 in.	0.09 Btu/hr·ft·°F	41.20 lb/cu ft	0.39 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M57	1/2 in. Plywood Sheathing	0.50 in.	0.07 Btu/hr·ft·°F	34.00 lb/cu ft	0.29 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M56	1/4 in. Plywood Sheathing	0.25 in.	0.07 Btu/hr·ft·°F	34.00 lb/cu ft	0.29 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M49	12 in. HW CMU	12.00 in.	0.81 Btu/hr·ft·°F	25.00 lb/cu ft	0.22 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M47	12 in. LW CMU	12.00 in.	0.40 Btu/hr·ft·°F	85.00 lb/cu ft	0.21 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M44	2 in. Insulation	2.00 in.	0.03 Btu/hr·ft·°F	2.00 lb/cu ft	0.20 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M68	2 in. Spray Insulation (horiz)	2.00 in.	0.01 Btu/hr·ft·°F	1.50 lb/cu ft	0.43 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M65	3/4 in. Hardwood Flr Plank	0.75 in.	0.09 Btu/hr·ft·°F	41.20 lb/cu ft	0.39 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M58	3/4 in. Plywood Sheathing	0.75 in.	0.07 Btu/hr·ft·°F	34.00 lb/cu ft	0.29 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M45	4 in. LW CMU	4.00 in.	0.25 Btu/hr·ft·°F	79.00 lb/cu ft	0.21 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M60	5/8 in. Gypsum Board-horiz	0.63 in.	0.09 Btu/hr·ft·°F	50.00 lb/cu ft	0.26 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M48	8 in. HW CMU	8.00 in.	0.64 Btu/hr·ft·°F	31.00 lb/cu ft	0.22 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M46	8 in. LW CMU	8.00 in.	0.27 Btu/hr·ft·°F	79.00 lb/cu ft	0.21 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M63	Asphalt Shingles (roof)	0.13 in.	0.02 Btu/hr·ft·°F	70.00 lb/cu ft	0.30 Btu/lb·°F	0.00 ft²·hr·°F/Btu
M79	Atest	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	7.00 ft²·hr·°F/Btu
M62	Carpet w/Rubber Pad	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	1.23 ft²·hr·°F/Btu
M70	Cement Board, 13mm	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	0.26 ft²·hr·°F/Btu
M71	EIFS	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	2.60 ft²·hr·°F/Btu
M76	Polysiocyanurate	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	7.20 ft²·hr·°F/Btu
M79	Polysiocyanurate1.5	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	10.80 ft²·hr·°F/Btu
M72	R13	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	13.00 ft²·hr·°F/Btu
M73	R15	0.00 in.	0.00 Btu/hr·ft·°F	0.00 lb/cu ft	0.00 Btu/lb·°F	15.00 ft²·hr·°F/Btu

CUSTOM MATERIAL

ENTERED VALUES
ROOM BY ROOM
By Savannah District

2 **Room - 102 RESOURCE CENTER** **Zone - 16**

GENERAL INFORMATION (Create Rooms - Rooms)

Size...	Floor area	263 ft²	Design...	Cooling DB:	75 °F
				Heating DB:	68 °F
Height...	Flr-Flr	12.5 ft		Relative humidity	50 %
	Plenum	3.3 ft	Thermostat...	Clg driftpoint:	90 °F
Duplicate...	Floor multiplier	1		Htg driftpoint:	55 °F
	Rooms per zone	1		Clg. Schedule:	None
				Htg. Schedule	None
				Location:	Room

Is There Carpet?: YES
Room Mass/avg. None
Slab Cnstr Type: 4* LW Concrete
Acoustical Ceiling Res. 1.786 hr·ft²·°F/Btu

PEOPLE AND LIGHTS (Create Rooms - Internal Loads)

People... Activity: None — Sensible 250 Btu/h
Density 4 People — Latent 200 Btu/h
Schedule Cooling Only (Design)

Lighting... Type: Recessed fluorescent, not vented, 50% load to space
Schedule Cooling Only (Design)
Fixture Type RECFL-NV
%Load to RA 50 %
Lighting Amount 384.0 W
Ballast Factor 1.0

AIRFLOW INFORMATION (Create Rooms - Airflows)

Ventilation... Classroom
Cooling 7 L/s/person
Heating 7 L/s/person
Schedule Available (100%)

Infiltration... None
Cooling 0 L/s/sq m
Heating 0 L/s/sq m
Schedule Available (100%)

Main Supply...
Cooling L/s
Heating L/s

Aux Supply...
Cooling L/s
Heating L/s

Vav Minimum...
Rate L/s/person
Schedule Available (100%)

Room Exhaust...
Rate 0.00 L/s
Schedule

ROOM COMPONENTS (Create Rooms - Roofs, Walls, Partn/Floors, Misc Loads)

No	Description	Area/ Amount	Dir	Tilt	Const Type/ Schedule	U Val	Alpha	Grnd Refl	Glass Type	Glass Area	Glass U Val	Glass Shad	External Shading	Adj Temp/ Internal Shading	Pct Sen/ Cool Tmp	Pct Rm/ Heat Tmp	Pct Ref/ Perm Len	Rad Frc/ Loss Coef
1	Wall - 1	112 ft²	0	0	Br764L	0.059	0.00	1.00					Overhang - None	None				
2	Wall - 2	161 ft²	270	0	Br764L	0.059	0.00	1.00	Br764/dh	42	0.60	0.88	Overhang - None	None				
1	Misc Equip 1	420.00 W			Cooling Only (Design)										0	0	0	0.00

SYSTEM ENTERED VALUES

By Savannah District

System - 1

Variable Volume Reheat (30% Min Flow Default)

Design Air Temp	Max		Min	
Cooling supply		°F		°F
Leaving Cooling coil	55	°F	52	°F
Heating supply	120	°F	90	°F
Leaving preheat coil		°F		°F

			Diversity	
Supply Duct Temperature Diff:	1	°F	People	100.00
Reheat Temperature Diff:	0	°F	Lights	100.00
Design Humidity Ratio Diff:		grains	Misc loads	100.00
Min Room Relative Humidity:		%		

Optional Ventilation

Cooling SADB:		°F	Off (0%)
Heating SADB:		°F	Off (0%)

Economizer

Type			Dry Bulb	Available (100%)
"On" Point:	65	°F	Max Percent OA:	100

Evaporative Cooling

Type:	None		
Direct efficiency	0	%	Available (100%)
Indirect efficiency	0	%	Available (100%)

Exhaust-Air Heat Recovery

Stage 1 Type:	None (default)	% Eff.
Exh-side deck	Outdoor & Rm Exh Mix	Available (100%)
Stage 2 Type:	None (default)	% Eff.
Exh-side deck	Outdoor & Rm Exh Mix	Available (100%)

Discriminator control Schedule	Off (0%)
Night Purge Schedule	Off (0%)
Optimum Start Schedule	Off (0%)
Optimum Stop Schedule	Off (0%)

Duty Cycling - "On" Period Schedule	Off (0%)
Duty Cycling - Pattern length (minutes)	
Duty Cycling - Maximum "off" time (minutes)	

Coil	Capacity	Schedule
Main cooling	100	% of Design Cooling Capacity
Auxiliary cooling		
Main heating	100	% of Design Capacity
Auxiliary heating		
Preheat	100	% of Design Capacity
Reheat	100	% of Design Capacity
Humidification	100	% of Design Capacity

Advanced Options

Cooling Coil Sizing Method:	Block	Supply Fan Motor Location:	Supply
Cooling Coil Location:	System	Return Fan Motor Location:	Omit
Ventilation Deck Location:	Return/Outdoor Deck	Supply Fan Cofiguration:	Draw Thru
System ventilation flag	SUM	Supply Fan Sizing:	Block
Supply Duct Location:	RETAIR		
Return Air Path:	PLENUM	Fan Mechanical efficiency :	75 %
Block Cooling Airflow:			

Fan	Type	Static Press.	Full Load Energy Rate	Schedule	Efficiency	Demand Limit
Primary	None	4.5	0.00000 kW/Cfm	Cooling Only (Design)	90	
Secondary	None	4.5	0.00000 kW/Cfm	Cooling Only (Design)	85	
Return	None	1.7	0.00000 kW/Cfm	Cooling Only (Design)	90	
System Exhaust	None	0.0	0.00000 kW/Cfm	Cooling Only (Design)	90	
Room Exhaust	None	0.0	0.00000 kW/Cfm	Cooling Only (Design)	85	
Optional ventilation	None	0.0	0.00000 kW/Cfm	Cooling Only (Design)	90	
Auxiliary	None	0.0	0.00000 kW/Cfm	Cooling Only (Design)	85	

System - 2

Variable Volume Reheat (30% Min Flow Default)

ENTERED VALUES
ROOM ASSIGNMENTS
By Savannah District

ASSIGNED ROOMS

Description

- System - 1
  - Zone - 1
    - Room - 106 Classroom/L.R.C.
  - Zone - 2
    - Room - 107 CLASSROOM
  - Zone - 3
    - Room - 108 CLASSROOM
- System - 2
  - Zone - 10
    - Room - 131 Chaplain
    - Room - 132 Chaplain Assist.
  - Zone - 11
    - Room - 124 Phys. Asst.
    - Room - 125 Duty Officer
  - Zone - 12
    - Room - 127 Medical Office
  - Zone - 13
    - Room - 123 NCOIC
  - Zone - 14
    - Room - 105 CORRIDOR
    - Room - 114 Lobby
  - Zone - 15
    - Room - 103 Tele./Elec.
  - Zone - 16
    - Room - 102 RESOURCE CENTER
  - Zone - 17
    - Room - 129 Work'n Stock Stor.
    - Room - 130 Deploy Stock Stor.
  - Zone - 18
    - Room - 128 Doctor
  - Zone - 19
    - Room - 214 Clerical/Central files
  - Zone - 20
    - Room - 219 S-2 OFFICER
    - Room - 220 Optional Office
    - Room - 222 Optional Office
  - Zone - 21
    - Room - 215 Pac Officer
  - Zone - 22
    - Room - 216 Clerical/Central Files

ENTERED VALUES
PLANTS
By Savannah District

Cooling Plant

Sizing Method
Heat Rejection type
Secondary Dist. Pump
Secondary Pump Cons.
Thermal Storage type
Thermal Storage Capacity

Equipment tag — Cooling Type:

Operating Mode	Capacity	Energy Rate	Pumps	Type	Full Load Consumption
Cooling			Chilled water		
Heat Recovery			Condenser water		
Tank Charging			Ht. rec. or Aux cond.		
Tank Chrg & Ht. Rec					

Heat Rejection Type
Thermal Storage Type
T-Storage Capacity
T-Storage Schedule

Max Chil. Water Reset
Load Shed. Econ
Evap. Precooling
Free Cooling type

Dmd. limit priority
Sequencing type
Energy Source
Reject Cond Heat
Cond. Heat to plant
Equip Schedule

Heating Plant

Sizing Method
Cogeneration type

Secondary Dist. Pump
Thermal Storage type
Thermal Storage Capacity

Equipment tag — Heating Type:

Heating Capacity
Energy Rate

Hot Water Pump type
Hot Water Pump Cons.

Thermal Storage Type
T-Storage Capacity
T-Storage Schedule

Equipment Schedule
Demand Limit Priority

APPENDIX L
REAL PROPERTY FACILITY EQUIPMENT

Appendix L

REAL PROPERTY FACILITY EQUIPMENT

Installation Number (Leave blank)

Facility Number: (Provide building number)

Equipment Tech Data Description: (Name of Equipment, i.e. 100 ton Trane chiller)

Equipment Category Code: (Leave blank)

Equipment Category Description: (Leave blank)

Equipment Category Code UM2: (tons, btuh, etc.)

Equipment Other Measure Total: (Provide numerical value of tons or btuh, etc)

RPE Equipment Description: (Provide equipment serial number)

RPE Equipment Number Units: (Provide number of chillers, boilers, etc)

Equipment Manufacturer Name:

RPE Equipment Date Installed: (Provide date equipment installed)

Equipment Model Number:

Date Equipment Warranty: (Date Warranty Ends)

SECTION 01012

DESIGN AFTER AWARD
(DESIGN/BUILD)
01/2002

1. GENERAL

The Contractor shall furnish and be responsible for a complete set of design documents as called for in Section 01010, DESIGN AND CONSTRUCTION REQUIREMENTS–STATEMENT OF WORK and as called for hereinafter.

1.1 Within 30 days after Notice to Proceed (NTP), the Contractor shall submit, for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly. No design submittals will be reviewed or evaluated until after receipt and acceptance of the proposed design/review schedule. Concurrent with submittal of design schedule Contractor shall submit, for information only, all supporting documentation including calculations and spreadsheets to show specifically how the Contractor plans to meet the overall requirements of the following SPiRiT points if applicable to the contract: 4.C1 Building Reuse, 4.C2 Reduce Construction Waste, 4.C3 Salvage/Reused Materials, 4.C4 Materials Recycled Content, 4.C5 Local/Regional Materials, 4.C6 Rapidly Renewable Materials and 4.C7 Certified Wood. This submittal will be used for reference in review of all subsequent design submittals to verify that overall goals are being met in individual portions of the design. No design submittals will be reviewed or evaluated until after receipt and acceptance of this documentation. As a minimum, design submittals are required at the preliminary (60%), final (100%), and at the design complete (Corrected final) stage. The requirements of each design stage are listed hereinafter. The Contractor shall reflect the number and schedules for the design submittals phases in the progress charts. As a maximum, the 60%, 100%, and design complete submittals shall be made in one consolidated package which includes each of the major categories listed in paragraph “Contents of Design Submittals”.
*4 *8
1.2 To facilitate fast-track design-construction activities the Contractor shall submit a 60% Site/Utility Design as the first design submittal. Following review, resolution, and incorporation of all Government comments. The Contractor shall submit100% site/utility design documents. After review, resolution and incorporation of all further Government comments, the Contracting Officer will authorize in writing the Contractor to proceed with site development activities within the parameters set forth in the accepted design submittal. Submittal review, comment, and resolution times from this specification apply to this initial 100% Site/Utility Design Submittal. No onsite construction activities shall begin prior to receipt of the Contracting Officer’s authorization. For demolition work a plan shall be submitted which meets the requirements of the State of North Carolina under their “Notification of Demolition and Renovation.”

1.3 The Contractor shall submit the design of the buildings at different stages of design to the Government for review. The drawings shall be grouped

by building type, each set complete by itself. All submittals required at each stage of design shall be submitted as a complete package at one time. No partial submittals will be reviewed. All design submittals shall include a Sustainable Design Summary Table showing all points required in all categories, a Sustainable Design Narrative and all supporting calculations and other documentation necessary to demonstrate that the requirements for the SPiRiT points applicable to the submittal have been met.

2. DESIGNER OF RECORD

The Contractor shall identify, for approval, the Designer of Record for each area of work. One Designer of Record may be responsible for more than one area. All areas of design disciplines shall be accounted for by a listed, registered Designer of Record. The Designer(s) of Record shall stamp, sign, and date all design drawings under their responsible discipline at each design submittal stage (see SCR - "Registration of Designers").

3. DEFINITION OF DESIGN SUBMITTALS

3.1 Corrected Proposal Submittal. The Contractor shall submit 10 copies of corrected drawings and technical proposal notebooks which incorporate any corrections on clarification items or deficiencies noted during negotiations for distribution to the Users and Government agencies. Submit the drawings in half size to the project manager within 30 days after contract award. This item only applies to the successful proposer after contract award, and only if there were requests for clarification or deficiencies noted.
*4
3.2 Site/Utility Design Submittals (60 and 100%). These~~This~~ submittals are ~~is~~ provided to allow the Contractor to concentrate initial efforts for the site/utility portions of the project. By allowing this work to be separated, the Contractor is given the opportunity to fast track and begin construction on the site/utility work prior to completion of the building designs. More specific submittal requirements by stage and discipline are identified in the Savannah District Design Manual. This is available on the Internet (under “Engineering Criteria”) at:

http://en.sas.usace.army.mil

3.2.1 The~~This~~ 60% submittal shall consist of the following:

3.2.1.1 Design analysis, developed to ~~100~~60%, site work and utility work only.

3.2.1.2 ~~100~~60% complete site/utility drawings.

3.2.1.3 ~~Final s~~Site/utility specifications developed to the 60% stage.

3.2.1.4 Environmental permits, as required. When environmental permits are not required, the Contractor shall provide a statement with justification to that effect.

3.2.2 The 100% submittal shall consist of the following:

3.2.2.1 Design analysis, developed to 100%, site work and utility work only.

3.2.2.2 100% complete site/utility drawings.

3.2.2.3 Site/utility specifications developed to the 100% stage.

3.2.2.4 Environmental permits, as required. When environmental permits are not required, the Contractor shall provide a statement with justification to that effect.

3.2.3~~5~~ See paragraph 1.3 for sustainable design submittal requirements.

3.3 Preliminary Conformance Review Submittal (60%). This submittal is intended to insure that the Contractor's design is proceeding in accordance with the terms of the solicitation and the Contractor's original proposal as well as in a timely manner. This submittal shall consist of the following:

3.3.1 Design analysis, developed to 60%.

3.3.2 60% complete drawings.
*8
3.3.3 Draft specifications. The draft specifications on all items of work submitted for 60% Design Review shall consist of legible marked up guide specifications.

3.3.4 Site utility design information need not be included in this submittal package except where interface to the interior building systems is required.

3.3.5 See paragraph 1.3 for sustainable design submittal requirements.

3.4 Final Design Submittal (100%). The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process as well as the original solicitation and the Contractor's proposal. The Contractor shall submit the following documents for Final Design Review:

3.4.1 60% review comments and responses annotated.

3.4.2 The Design Analysis submitted for Final Design Review shall be in its final form. The Design Analysis shall include all backup material previously submitted and revised as necessary. All design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions which would not be obvious to an engineer reviewing the final drawings and specifications.

3.4.3 The contract drawings submitted for Final Design Review shall include the drawings previously submitted which have been revised and completed as necessary. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall be complete at this time including the incorporation of any design review comments generated by the previous design reviews. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction. Shop drawings will not be considered as design

drawings. All design shall be shown on design drawings prior to submittal of shop drawings. Each discipline has unique Final Design submittal requirements. Respective chapters of the Savannah District Design Manual should be reviewed to determine the exact nature of these requirements.

Example for HVAC Controls: HVAC Controls System Drawings (MC-Plates) shall be submitted at the final design stage and shall include the following.

HVAC Controls System Legend
Control System Schematic
Equipment Schedule
Valve Schedule
Damper Schedule
Sequence of Operations
I/O Summery Table and Data Terminal Strip Diagram
Wiring Diagram
Communications Network and Block Diagram
Metering of Utilities (gas, electrical and water)
DDC Panel locations

The control drawings shall use the Corps of Engineers standard control drawings. These drawings are available at the following website: http://www.sas.usace.army.mil/eng/hvac/ or on the SAS_STD CD available from the project manager.
*8
3.4.4 The ~~draft~~ specifications on all items of work submitted for Final Design Review shall consist of ~~legible marked up~~properly edited guide specification sections.

3.4.5 Site utility design information need not be included in this submittal package except where interface to the interior building systems is required.

3.4.6 Design Quality Control Checklist as required in SECTION 01451.

3.4.7 See paragraph 1.3 for sustainable design submittal requirements.

3.5 Design Complete Submittal (Corrected Final). After the Final Design Review, the Contractor shall revise the contract documents by incorporating any comments generated during the Final Design Review and shall prepare final hard copy contract specifications. The Contractor shall submit the following documents for the design complete submittal:

3.5.1 Design analysis in final 100% complete form.

3.5.2 100% complete drawings.

3.5.3 Final specifications

3.5.4 Final review comments and responses.

3.5.5 Electronic Submission. All CADD files in native MicroStation format, as well as all prepared technical specifications shall be provided on CD-ROM. Two copies are required.

*4
3.5.6 No work will begin on new buildings until the design complete submittal (corrected final) has been approved.

3.6 Structural Interior Design (SID).

3.6.1 Definition. The Structural Interior Design (SID) shall involve the selection and sampling of all applied finishes including material, color, texture and patterns necessary to complete the building's interior architectural features. The SID shall also include all prewired workstation finishes and required drawings for prewired workstations. This information shall be submitted in 3" D-ring binders, 8-1/2" x 11" format.

3.6.2 Present architectural finish samples in an orderly arrangement according to like rooms/areas receiving like finishes. Each like room receiving like finishes will be noted as a Color Scheme. Each Color Scheme shall have a written description of material used. This written description shall use the same material abbreviations and notes that appear on the Room Finish Schedule and Legend in the contract drawings. Present prewired workstation finishes on a color board separate from the architectural finishes. Submit the SID binders concurrently with the architectural design submittals.

3.6.3 Preliminary Submittals. The Contractor shall submit three complete sets of the initial SID package. The design philosophy shall use a warm neutral background color with appropriate accent colors. All SID proposals shall be reviewed and approved by the Government. The Interior Designer shall revise the SID binders after each review and update the SID to satisfy review comments. Each submittal will follow this method of review until the Government approves the completed SID package.

3.6.4 Final Submittal. After approval of the Preliminary Submittal, the Contractor shall submit three (3) complete sets of the approved and final Structural Interior Design packages. Once the Contractor has submitted the SID and the Government has approved the submittal, all materials, finishes, colors, textures and pattern submitted and approved for this project are then considered as part of the contract and the Contractor shall furnish all approved SID finishes. No deviations will be considered.

3.6.5 Format. Submit all SID information and samples on 8-1/2" x 11" modules with only one foldout. The maximum foldout width shall be approximately 25 inches. No foldouts on the top or bottom of the pages. Place the project title, base, architectural firm, page number and date on the bottom of each page or module.

3.6.5.1 The module shall support and anchor all samples. Anchor large or heavy samples with mechanical fasteners, velcro or double sided foam tape. Rubber cement or glue will not be acceptable.

3.6.5.2 Assemble the 8-1/2" x 11" pages and modules in a 3" D-ring binder. Holes for placement of the modules in the binder shall be 3/8" in diameter. Each binder shall be identified on the outside spine and front cover by title, project number, percentage phase and date.

3.6.5.3 Material and finish samples shall indicate true pattern, color and texture. Carpet samples shall be large enough to indicate a complete pattern or design.

3.6.5.4 Where paint manufacturers' color names and numbers are used indicate the finish of the paint such as gloss, semi-gloss, flat and so on.

3.6.5.5 Signage may include emblems, striping, letters, numbers and logos. The interior designer shall consider visual appearance, organization, location, structural supports (if required) and relation to other base graphics. Indicate on a separate signage sheet the location and message for all signage. Submit a sample of the signage material finish and color with the structural finishes.

3.6.5.6 No photographs or colored photocopies of materials will be accepted or approved.

3.6.6 The SID binder shall include the following information at each design submittal in this order:

==========
SEQUENCE OF SID SUBMITTAL

1. Title page

2. Table of contents

3. Design objectives - A statement of design objectives explaining the interior design philosophy of the facility shall be provided in the SID. Design objectives and the proposed method of accomplishing the objectives. Shall cover, when applicable, energy efficiency, safety, health, maintenance, image, personal performance of occupants and functional flexibility.

4. Interior floor plan

5. Interior sample finish boards

Scheme A
Scheme B
Scheme C

Example: All restrooms could be noted as color scheme "A", all general open office finishes could be noted as color scheme "B" and the main lobby could be noted as color scheme "C".

6. Room finish schedule

7. Signage

8. Signage plan

9. Prewired workstation composite floor plans

10. Prewired workstation typicals - elevations and component inventory.

11. Prewired workstation panel identification plan with electrical outlet placement including base feed.

12. Integration and layout of ACSIM specific furniture. Plan must show suitability of proposed space to suit the furniture to be provided.

==========

4. GOVERNMENT APPROVED DESIGN SUBMITTALS

The approval of submittals by the Contracting Officer shall not be construed as a complete check, but will indicate only that the design is in conformance with the contract requirements. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor is responsible for the design and construction of all work.

5. MAILING OF SUBMITTALS

All submittals to the Government during design shall be mailed using overnight mailing service. Each copy of the submittals shall be mailed to the addresses listed below. Each submittal shall have a transmittal letter accompanying it which indicates the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

Addresses and submittal distribution:

1. U.S. Army Engineer District, Savannah
ATTN: CESAS-PM-MB/ Mr. Diego Martinez
100 W. Oglethorpe Avenue
P.O. Box 889
Savannah, GA 31402-0889
*4

2. U.S. Army Corps of Engineers,
North Carolina Area Office
ATTN: CESAS-CD-BRC
Bldg A-4272~~MT 2357~~, Atchley and Ogden Streets~~L Street~~
Fort Bragg, NC 28307
*4 *5

3. Public Works Business Center (AFZA-PW-CR/Mr. Locklear)
HQ, Fort Bragg Garrison Command (Abn)
Installation Management Agency
Fort Bragg, NC 28310-5000

4. Director USAISEC-FDEO
ATTN: AMSEL-IE-DE-IN-CO (Mr. Gaffney)
1435 Porter Street, Suite 200

Fort Detrick, Maryland 21702-5047

5. Eastern Paralyzed Veterans Association
Architecture & Facilities Management
75-20 Astoria Boulevard
Queens, NY 11370-1178

The following table lists the number of copies of design submittal requirements for this project:

(1) Corrected Proposal
COE 10 1/2 Size drawings
SAS 10 Revised Proposal Notebooks

	#	Item 60%	#	Item Final	#	Item Corrected Final
(1)	8	Design Anal.	8	Design Anal.	3	Design Anal.
COE	8	Drawings	8	Drawings	3	Drawings
SAS	8	Spec.	8	Spec.	3	Spec.
			8	Ann. Comments	3	Ann. Comments
	2	Permit Appl.	2	Permit Docum.	2	CD's w/all electronic
	1	SID	1	SID		files
	1	CID	1	CID		
*4						
(2)	3	Design Anal.	3	Design Anal.	1	Design Anal.
CD-BRC	3	Drawings	3	Drawings	6	Drawings
	3	Spec.	3	Spec.	6	Spec.
			3	Ann. Comments	6	Ann. Comments
	2	Permit Appl.	2	Permit Docum.	2	Drawings, full size
	1	SID	1	SID	2	CD's w/ all electronic
	1	CID	1	CID		files
(3)	15	Design Anal.	15	Design Anal.	2	Design Anal.
PWBC	15	Drawings	15	Drawings	2	Drawings
	15	Spec.	15	Spec.	2	Spec.
			12	Ann. Comments	2	Ann. Comments
	2	Permit Appl.	12	Permit Docum.	2	Permit Docum.
	1	SID	1	SID	2	CD's w/all electronic
	1	CID	1	CID		files
(4)	1	Design Anal.	1	Design Anal.		
ISEC	2	Drawings	2	Drawings		
	2	Spec.	2	Spec.		
			2	Ann. Comments		
(5)	1	Design Anal.	1	Design Anal.		
EPVA	1	Drawings	1	Drawings		

1 Spec. 1 Spec.
1 Ann. Comments

6. GOVERNMENT REVIEWS

The Government will take 21 days to review and comment on each design submittal. For each design review submittal, the Contracting Officer's Representative (COR) will furnish, to the Contractor, a single consolidated listing of all comments from the various design sections and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the solicitation and the successful offeror's (Contractor's) RFP proposal. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within 5 days after receipt of these comments in order that the comment can be resolved. The Contractor shall furnish disposition of all comments, in writing, with the next scheduled submittal. The Contractor is cautioned in that if he believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the COR in writing immediately. Review conferences will be held for each design submittal at the Installation. The Contractor shall bring the appropriate design staff to the review conference. These conferences will take place the week after the receipt of the comments by the Contractor.

ProjNet/DrChecks is the required method for preparing and annotating comments. This is an Internet based database available on the Internet at:

http://65.204.17.188/projnet/home/version1/

User ID and password will be granted at the submittal stage.

6.1 If a design submittal is late by the approved schedule, the review will slip accordingly. The review process will not be shortened. Submittals date revisions must be made in writing at least 1 week prior to the effect submittal.

6.2 Post Review Conference Action. Copies of comments, annotated with comment action agreed on, will be made available to all parties before the conference adjourns. Unresolved problems will be resolved by immediate follow-on action at the end of conferences. Valid comments will be incorporated. After receipt of final corrected design documents upon incorporation of backcheck comments the Project Manager will recommend issuance of a Construction Notice to Proceed (NTP). The Government, however, reserves the right to disapprove design document submittals if comments are significant. If final or backcheck submittal(s) are incomplete or deficient, and require correction by the Contractor and resubmittal for review, the cost of rehandling and reviewing will be deducted from payment due the Contractor at the rate of $ 5,000.00 per submittal.

7. COORDINATION

7.1 Written Records. The Contractor shall prepare a written record of each design site visit, meeting, or conference, either telephonic or personal, and

furnish within 5 working days copies to the Contracting Officer and all parties involved. The written record shall include subject, names of participants, outline of discussion, and recommendation or conclusions. Number each written record for the particular project under design in consecutive order.

7.2 Design Needs List. Throughout the life of his contract the Contractor shall furnish the COR a monthly "needs" list for design related items. This list shall itemize in an orderly fashion design data required by the Contractor to advance the design in a timely manner. Each list shall include a sequence number, description of action item, name of the individual or agency responsible for satisfying the action item and remarks. The list will be maintained on a continuous basis with satisfied action items checked off and new action items added as required. Once a request for information is initiated, that item shall remain on the list until the requested information has been furnished or otherwise resolved. Copies of the list will be mailed to both the Administrative Contracting Officer and the agencies tasked with supplying the information. It is highly recommended that the Corps' RFI system be utilized during the design phase for this purpose. Originally developed for the construction phase but it works well for both. The system has report capability. User access and passwords will be furnished at the time needed with over the phone instructions.

8. DESIGN ANALYSIS

8.1 Media and Format. Present the design analysis on 8-1/2 inch by 11-inch paper except that larger sheets may be used when required for graphs or other special calculation forms. All sheets shall be in reproducible form. The material may be typewritten, hand lettered, handwritten, or a combination thereof, provided it is legible. Side margins shall be 1 inch minimum to permit side binding and head to head printing. Bottom margins shall be 1-1/4 inches, with page numbers centered 1 inch from the bottom.

8.2 Organization. Assign the several parts and sheets of the design analysis a sequential binding number and bind them under a cover indicating the name of the facility and project number, if applicable. The title page shall carry the designation of the submittal being made. The complete design analysis presented for final review with the final drawings and specifications shall carry the designation "FINAL DESIGN ANALYSIS" on the title page.

8.3 Design Calculations. Design calculations are a part of the design analysis. When they are voluminous, bind them separately from the narrative part of the design analysis. Present the design calculations in a clean and legible form incorporating a title page and index for each volume. Furnish a table of contents, which shall be an index of the indices, when there is more than one volume. Identify the source of loading conditions, supplementary sketches, graphs, formulae, and references. Explain all assumptions and conclusions. Calculation sheets shall carry the names or initials of the author and the checker and the dates of calculations and checking. No portion of the calculations shall be computed and checked by the same person.

8.4 Automatic Data Processing Systems (ADPS). When ADPS are used to perform design calculations, the design analysis shall include descriptions of the computer programs used and copies of the ADPS input data and output summaries.

When the computer output is large, it may be divided into volumes at logical division points. Precede each set of computer printouts by an index and by a description of the computation performed. If several sets of computations are submitted, they shall be accompanied by a general table of contents in addition to the individual indices. Preparation of the description which must accompany each set of ADPS printouts shall include the following:

1. Explain the design method, including assumptions, theories, and formulae.
2. Include applicable diagrams, adequately identified.
3. State exactly the computation performed by the computer.
4. Provide all necessary explanations of the computer printout format, symbols, and abbreviations.
5. Use adequate and consistent notation.
6. Provide sufficient information to permit manual checks of the results.

9. DRAWINGS

9.1 Purpose and Scope. This section sets forth criteria and standards to enable designers and drafters to prepare a clear, uniform set of design drawings and illustrations. Unless specifically noted in the A-E's scope of work, the standards for drawing presentation contained in this chapter shall be used in the preparation of all drawings required in a contract.

9.2 Applicable Publications. The publications listed below, hereinafter referred to by basic designation only, shall be used when preparing drawings. In each case, the most current edition existing at the beginning of the design shall be used.

Tri-Service A/E/C CADD standards Release 2.0 available on Internet at http://tsc.wes.army.mil/

This publication clearly delineates drawing requirements for military drawings consistent with the basic guide criteria, ER 1110-345-710, Engineering and Design Drawings.

9.3 Computer Aided Design and Drafting (CADD).

9.3.1 The following CADD file requirements will apply:

a. A CD containing Intergraph Microstation Design files shall be provided from PWBC to the designer. The files shall be used as seed files for the creation or origin of all project design files. The civil seed file used for mapping will be registered to the North Carolina State Plane Coordinate System – Zone 3200 – NAD83 -- U.S. Survey Feet. The file registration shall not be changed and shall be maintained at the setting provided. Elevation units will be MSL GRS80 U.S. Survey Feet. The CADD Details Library provided by the CADD/GIS Technology Center should be used as much as practicable. The A/E/C CADD Standards Release 2.0 and the Tri-Service Workspace is provided by the CADD/GIS Technology Center to set forth standards that will provide a consistent and compatible platform for CADD system use Corps-wide. The establishment of a uniform CADD platform will provide a means for rapid,

accurate transfer and integration of virtually all project-related information throughout the life cycle of any building project or facility master plan. Savannah District, along with most other COE districts, has chosen to make Bentley MicroStation and related products, the CADD system of record. All translations from other systems to assure compatibility must be the task of the A-E firm and not of Savannah District personnel.

b. As a **minimum** each drawing in a design shall have an electronic file copy. Only **one** drawing should occupy an electronic file. With very few exceptions, all drawings will be plotted black and white.

c. A key plan should be displayed on each plotted drawing that depicts topographic information or plans that are broken due to size and scale.

d. The **electronic files** should be saved with the composite drawing (drawing as it is to be plotted) in View 1.

e. All referenced files are to be attached without drive or directories (**no paths**).

f. The electronic file naming convention is an alpha/numeric 8-digit name for drawing files. Savannah will furnish a three-digit project code to preface the name of each file. This has to be requested at the beginning of any design effort for Savannah District. Spatial Engineering Section is the proponent of this action.

g. The **electronic file name** should be displayed on each drawing.

9.3.2 The particular requirements of the computer graphic **deliverables** are itemized as follows:

a. As a minimum each drawing represented in a design should have an electronic file. The acceptable file format standard is MicroStation (.DGN). Any supporting files, cell and font libraries must also be furnished to the Savannah District with the electronic files. All work should be completed using default settings with no specialized font or line styles.

b. A text or spreadsheet file listing each electronic file name, drawing plate no., and drawing title shall be included with the electronic drawing files and submitted in hard copy form. The electronic file names shall also be incorporated on the drawings index sheet as columns adjacent to the corresponding drawing identification. The electronic media used for delivery should be: CD-ROM created with a drive adhering to **ISO 9660**.

9.3.3 The A-E shall comply with the following standards.

A/E/C CADD Standards from Tri-Service CADD GIS Technology Center
http://tsc.wes.army.mil/

9.3.4 Questions concerning CADD, filing, retrieving files, researching standard designs from previous projects or archived files should be directed to Spatial Engineering Section.
*8

9.4 Submittal Requirements. The drawing guidance given in this chapter is applicable to submittals. Electronic files shall be submitted for technical adequacy review at each submittal stage. Submit all the CADD drawing files with the hard copy submittal to the Project Engineer. CADD drawing files must be submitted in MicroStation DGN, and CAL Type 1 format. ~~Only one~~Threes sets of the CADD files is required. Each electronic drawing submittal package (CD-ROM) must display a label with:

Base name
Project name
Design submittal phase
Firm Name.

9.4.1 Prework Map Site Drawings. Microstation design files shall be provided from PWBC to the designer. The files shall be used to complete all project design files. This design file provided the designer shall provide a single map of the entire site indicating the location of existing utilities, roads, structures etc., however, the accuracy or completeness of this map is not guaranteed. The designer shall verify existing map data and provided data for any features not shown on the provided map. A prework site map shall be produced by the designer to show all existing and proposed utilities and other constructions to include the footprint of structures, paving (including curbing), sidewalks, and other relevant planimetric features. Due north on the map will be at the top of the page as viewed from the bottom of the map. Rotations will not be allowed nor will orientation to Magnetic North. The map will contain a labeled coordinate grid with spacing appropriate to the map extents. For instance, a map scale of 1″=30′ will have coordinates labeled at 100′ intervals north/south and east/west. Center should be used as much as practicable. A minimum of four tie-in points will be labeled on the map located near the four corners of the map. The tie-in points will show a symbol at the location of the point and a label indicating the Northing and Easting of each point.

9.5 Final (100 Percent) Design Submittal Requirements. The drawing guidance given in this section is applicable to the Final (100 Percent) Design submittal. Due to the design/build process often design submittals are prepared in increments based on disciplines or phases of construction. Typically the civil site plan and layout drawings are the first to be finalized. One complete design package of all plans necessary to complete the project shall be assembled in the same manner as if the design had been complete in every respect prior to start of construction. This final submittal will include all civil, architectural, mechanical, electrical, structural, environmental and any other drawings necessary to complete the construction.
*8
9.5.1 All title block information (titles, numbering, etc.) must be complete in the Final (100%) Design submittal. This submittal shall include **all** electronic files necessary to display every drawing for the design. CADD drawing files must be submitted in MicroStation .DGN, **and** CAL Type 1 format. A hard copy plot of each drawing must also be submitted as specified elsewhere. ~~Only one~~Three sets of the CADD files is required. Each electronic drawing submittal package (CD-ROM) must display a label with:

Base name
Project name
Design submittal phase
Firm Name.

9.6 Corrected Final Design Submittal Requirements.

9.6.1 Notice. Corrected Final submittals are not considered a normal design level and are required only when Final submittals must be revised or corrected due to error or omission.
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9.6.2 General. The drawing guidance given is applicable to the Corrected Final Design submittal. This submittal shall include **all** electronic files necessary to display every drawing for the design. CADD drawing files must be submitted in MicroStation .DGN, **and** CAL Type 1 format. A hard copy plot of each drawing must also be submitted as specified elsewhere. ~~Only one~~Three sets of the CADD files is required. Each electronic drawing submittal package (CD-ROM) must display a label with:

Base name
Project name
Design submittal phase
Firm Name.

9.7 Materials.

9.7.1 Drawing Media. Drawings shall be plotted on bond paper, English Inch Pound Unit Projects drawing size F (30" x 42" overall) or Metric Unit project drawing size A1 (841 x 594). These borders, title blocks, and zoning are provided to A/E's by Savannah District Spatial Engineering Section. A new border sheet file should be obtained each time a new project is begun due to changes in border requirements.

9.7.2 Other Media. There are various electronic files available from Savannah District, Spatial Engineering Section. The A-E should request CD-ROM with files through the Project Engineer, or ask for the current Web page where they can be found. Formats available on CD are the following:

a. Border Sheets English jobs
b. Cover Sheet (for jobs with more than 50 drawings - see Savannah District Drafting Standards)
c. Combination Cover/Index Sheet (for jobs with 50 or less drawings)
d. Index of Drawings (for use with Cover Sheet)
e. Location Plans

9.7.3 General Requirements.

9.7.3.1 All drawings will be prepared electronically with software compatible and approved by Savannah District, unless a special waiver has been obtained from Project Management. Color plotting is not acceptable for contract drawings.

9.7.3.2 Excessive patterning should be avoided. Associative patterning or hatching should be used for area patterns and line styles should be used in lieu of linear patterns. The use of multiple line placements to depict line width is not advised.

9.8 Drawing Preparation.

9.8.1 Drafting Standards. All line work, text, symbolizing, and other aspects of drafting shall be accomplished in accordance with standard drafting practices. Consistency is essential throughout the drawing set, from one discipline to the next the drawing appearance (text size, font, case, line weight consistency, etc. should be constant. Complete legends of symbols and lists of abbreviations shall be included on the drawings for all submittals so that their meanings are clear. Key plans and match lines should also be used.

9.8.2 Half-size Reduction. Particular care shall be exercised to insure that all work is prepared for half-size printing. Congested areas should be enlarged to a suitable scale. For any sheet or part of a sheet not meeting this standard, the designer will be required to promptly re-scale and resubmit, at no additional expense to the Government, a new drawing which is completely readable when reduced half size. Drawings Incorporating Photographs. Certain project drawings (e.g., operations and maintenance work, rehab projects, etc.) may be best portrayed by use of digital or scanned photographic images of the actual buildings or aerial photographic site plans. This method may be used only if the text and line work is placed on a separate level from the basic photograph. (The border and title block should be a reference file to the photograph.) Also, those portions of the photograph which lie beneath the text and/or line work must be removed in order to ensure clarity and readability of the composite drawing.

9.8.3 Line Weights. Line weights are illustrated in the A/E/C CADD Standards. Additionally, special care should be taken to distinguish between new and existing work. Line weights for new work shall be heavier than for existing work where they both occur on the same drawing. Only the line weight variations can effectively distinguish between new and existing work on the full-size prints. Scale and space permitting, a separation of three line weights will be used to distinguish new from existing.

9.8.4 Text. Text shall appear to be single stroke commercial Gothic style, all capitals. Minimum height and width shall be 1/8" inch. The recommended MicroStation fonts are 1 and 3. Font 3 is particularly well suited for tables and rows of numerals. Generally only **one** font should be used on an entire set of drawings. This font will vary only in size and line weight. True type fonts are allowed but care should be exercised to have the same fonts used throughout the drawing set.

9.9 Drawing Format.

9.9.1 General. All projects shall have a cover and an index sheet or a combination thereof. The drawing Cover Sheet does not require a title block.

9.9.2 Numbering System. The explanations given below refer to numbering required in title blocks.

9.9.2.1 The Category Code Number, reflecting Army and Air Force criteria, defines facility classification category code, and sequence for that type facility. This unique seven-digit number set should be added to the border sheet where indicated.

9.9.2.2 The Plate Number assigned to each drawing is defined in the A/E/C CADD standard.

9.9.2.3 The Sheet Number is a sequence number placed consecutively within each drawing set. The total number of drawings in the set, noted thus: SHEET 1 OF XXX, will be indicated **only** on the first sheet in the set. The single sheet number will be placed on the following sheets is sequence. This will facilitate later revisions. NEVER RENUMBER SHEETS AFTER FINAL SUBMITTAL. If you need to add sheets, simply add a suffix to the sheet number. Example, adding a drawing between sheets 21 and 22. This sheet number would be 21A. The same applies to the CAL files. **DO NOT RENUMBER AFTER FINAL SUBMISSION**.
*8
9.10 Drawing Revisions. In general, the designer/drafter/contractor may be involved in three types of project revisions: ~~preparation~~ incorporation of amendments issued during the design/build RFP process, the preparation of contract modifications during design and construction, and the as-built drawing conditions. The methods and procedures for reflecting these changes on drawings are described below.
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9.10.1 Amendment Drawings. **All amendment revisions to drawings** ~~**are made by issuing new revised drawing(s)**~~**issued during the design/build RFP process shall be incorporated into the RFP documents**. Use the first available space in the revision block and identify it as Revision 1 (teardrop), or the next sequentially higher number for that drawing. Thus, the revision (teardrop) numbers for a given amendment may vary from drawing to drawing and will not necessarily match the amendment number itself.

9.10.1.1 Revised Reissued Drawings. Where revised drawings are to be reissued the following shall apply. All revised drawings will be annotated by symbol (teardrop) on the drawing at the point of revision and will carry a revision number, which will be shown in the column headed "Symbol" in the revision block of the drawing. Zones will be identified when practicable. The zones appear along the borders of the drawings and are used for location purposes within the drawing (numbers horizontally and letters vertically). A brief description “REVISED IN ACCORDANCE WITH AMENDMENT 000#” will be entered under "Description" in the drawing revision block

9.10.1.2 Added Drawings. For sheets to be added by amendment, the revision block will be annotated "SHEET ADDED BY AMENDMENT" at the "Description", no teardrop should be placed in the symbol area. Added sheet titles and other information will be shown on the Index of Drawings sheet.

9.10.1.3 Deleted Drawings. For sheets to be deleted by amendment, the revision block will not be teardropped and the words "SHEET DELETED BY

AMENDMENT" will be entered under "Description" and the revision block initialed. Sheets deleted by amendment will be shown as "Deleted" on the Index of Drawings sheet.
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9.10.2 Modification Drawings. Modifications to ~~construction~~ design/build contracts are high priority items and shall be acted upon without delay. Timely preparation of changes to contract documents ~~to accompany the~~ required by modification ~~package~~ will prevent undue delay in construction schedules. Upon receipt of design requirements for a ~~proposed~~ modification, the A-E will proceed with preparation of the necessary changes or additions. The completed package will be forwarded to the ~~Project Manager for finalization and subsequent implementation by Construction Division~~Administrative Contracting Officer for review and approval. Modifications to the construction contract may be accomplished by application of one or more methods available to the A-E. Formulating a clear, concise, and accurate modification package cannot be overemphasized.

9.10.2.1 A method of modifying the contract documents is to revise an existing drawing. Care should be taken in conforming to Drafting Standards. Acceptable terminology which should appear in the revision block “REVISED BY MODIFICATION #. Each modification should be properly teardropped, described, dated, and initialed by the A-E firm.

9.10.2.2 Occasionally a modification requires preparation of one or more new sheets because of the magnitude of the change. For sheets to be added by modification, the revision block will not be teardropped and the words "SHEET ADDED BY MODIFICATION #” will be entered under "Description" and the revision block initialed. Care should be exercised in assigning sheet and plate numbers to new drawings. For example, if a new sheet is to be inserted between existing Sheets 19 and 20, the proper identification would be Sheet 19A. All drawings added by modification should be noted on the Index of Drawings.

9.10.3 As-built Working Drawings. The Contractor shall revise two sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and available on the job site at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of specific phases of work (foundations, utilities, structural steel, etc., as appropriate for the project). The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to incremental submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. Noncompliance with regard to maintaining as-built drawings will be consideration for an interim unsatisfactory Contractor performance evaluation.

9.10.3.1 As-built Drawings at Construction Completion. The contractor shall modify the electronic design file prework site map at construction completion to indicate the as-built character of all site components:

a. This map will conform to the specifications of the pre-work map and be free of any superfluous construction detail. The intent is to show As-Built conditions and should not include any components that are not as-built, i.e., if the prework map showed a water line 3’ from a curb and was constructed 4’ from the curb, the as-built map will show only the final location of the water line with dimensions.

b. The map will clearly indicate the final grade of the site at a contour interval not greater than one foot.

c. The final inverts of all utilities will be shown on the plan drawings. Data from profile drawings shall be transferred as installed to “Plan” sheet drawings. Where utilities were installed which follow the surface of the ground, the depth of that utility will be indicated. Where there is a variance in the depth of the utility, the break point and character of variance will be shown. All utilities on the map will be clearly labeled as to size and material. Where utilities are to be enclosed in conduits or duct work, a section of the duct will be shown clearly indicating the dimensions and material of the duct, the contents of the duct such as wire size and type of conductor, whether conductor is primary or neutral, number of conductors, hot water supply or return, pipe size, insulation type and thickness, etc. The map will show the invert elevation of all manholes as well as the invert of each pipe joining a manhole as well as the invert and character of all outfalls on plan drawings.

d. The map will clearly show any utilities installed with a trace wire and/or cathodic protection.

e. The map will show a minimum of two tie points for all subsurface control devices to include valves, manholes, handholes, switches, etc. The tie-points will be directed such that they form a triangle with no inclusive angle less than 30° or greater than 150°. No leg of the triangle will be longer than 100’. Valid tie-points will run to identifiable above ground objects such as poles or building corners as is in keeping of good survey practice for the recovery of monuments.

f. The map will clearly indicate the entry point and character of all utilities running to or from structures. Entry point shall be identified by dimensions from two adjacent building features and the depth at point of entry.

9.10.3.2 The Contractor shall modify the electronic design files at construction completion to indicate the as-built character of all architectural, mechanical and electrical components. Electrical panel schedules, loads and ratings shall be revised to reflect actual installed components. Mechanical system components will be identified with manufacturer name and model, and performance or capacity ratings of actual components.

9.10.3.3 When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 3/16 inch high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

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9.10.3.4 After receipt by the Contractor of the approved working as-built prints and approval of completed sections of final as-builts the Contractor shall, within 30 days for each specific phase of work for contracts less than $5 million, or 60 days for each specific phase of work for contracts $5 million and above, make the final as-built submittal. This submittal shall consist of ~~one~~ three ISO 9660 compact disc, read-only memory (CD-ROM), and two sets of prints of these drawings and the return of the approved marked working as-built prints. They shall be complete in all details and identical in form and function to the contract drawing files. Any transactions or adjustments necessary to accomplish this are the responsibility of the Contractor. All paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract and shall be grounds for a final unsatisfactory Contractor performance evaluation. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.
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9.10.3.5 Payment. ~~No separate payment will be made for as-built drawings required under this contract, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor.~~A separate bid amount will not be made for as-built drawings required under this contract, and all costs in connection therewith shall be considered a subsidiary obligation of the Contractor. Payment in the amount of $5,000 for contracts less than $5 million or $10,000 for contracts $5 million or above will be retained by the Government until all as-built drawings requirements have been completed.

10. SPECIFICATIONS

10.1 The project specifications shall be prepared using UFGS and Ft. Bragg specific guide specifications as specified in Section 01010, DESIGN AND CONSTRUCTION REQUIREMENTS – STATEMENT OF WORK. If a UFGS guide specification cannot be found, contact Savannah District to see if a guide specification exists. If a guide specification does not exist the Design/Build Contractor will prepare a job-specific specification. The UFGS shall be edited and adapted by the designer for this project, incorporating UFGS instructions and recommendations in the notes to specifier contained in the guide specs. The designer is to delete inapplicable portions of the guide specification and revise and/or supplement, as required, the applicable portions to provide a complete project specification. Editing of specifications shall be for bracketed options and project requirements as stated in the RFP only. Deviations will not be allowed without prior approval from the Contracting Officer. Specifications shall be submitted at final design submittal in hard copy form that shows the text added and deleted with additions highlighted and deletions lined through but still readable. This feature is available in SPECSINTACT. UFGS sections and Ft. Bragg specific guide specifications shall be submitted by the Design/Build Contractor as specified in Section 01010, DESIGN AND CONSTRUCTION

REQUIREMENTS – STATEMENT OF WORK and as needed to address all portions of the work in the accepted proposal. The Division 1 GENERAL specifications provided in the RFP shall be used. No changes will be allowed to these sections.

Unified Federal Guide Specifications (UFGS) and Ft. Bragg specific Guide Specifications are available on the Internet at:

http://www.hnd.usace.army.mil and http://en.sas.usace.army.mil/

Many of these specifications are in Specsintact format (*.sec). Specsintact software is available free of charge at:

http://si.ksc.nasa.gov/specsintact

10.2 Submittal Register. Develop the construction submittal requirements during the design phase of the contract. List the submittal requirements in paragraph SUBMITTALS of each specification section. The SPECSINTACT program generates a submittal register from these paragraphs. Include this register at the end of Section 01330 SUBMITTAL PROCEDURES (DESIGN BUILD). The Contractor shall be responsible for listing all required submittals necessary to insure the project requirements are complied with. The submittals paragraph shall identify submittal items such as shop drawings, manufacturer's literature, certificates of compliance, material samples, guarantees, test results, etc. that the Contractor shall submit for review and/or approval action during the life of the construction contract.

11. CONTENTS OF DESIGN SUBMITTALS

11.1 100% SITE/UTILITY DESIGN SUBMITTAL. The 100% site/utility design submittal shall contain, as a minimum, the following. Sustainable design requirements shall be incorporated into the drawings and specifications.

11.1.1 General Narratives:

11.1.1.1 Site/Layout. Explanation of objectives and factors influencing siting decisions. General overview of major site features planned, such as building orientation, drainage patterns, parking provisions, traffic circulation, provisions for the handicapped, security requirements, etc. Rationale for locating major site elements. Set back requirements or specific clearance requirements. Locations of borrow and spoil areas.

11.1.1.2 Utility Systems. Design narrative for the natural gas, water supply, storm drainage, and wastewater systems relating to this project. Include an analysis of the existing distribution systems capability to supply sufficient quantity at adequate levels. If the existing distribution systems are inadequate, provide the design solution to augment the systems to provide the requirements for the new facilities.

11.1.2 All drawings included in the required technical data for the proposal submission (see Contract Clauses, TECHNICAL SUBMISSION REQUIREMENTS AND INSTRUCTIONS) shall be developed to 100 percent completion. In addition to

the individual utility plans, submit a combined utility plan drawn to the same scale as the individual utility plans.

11.1.2.1 General Site Layout. Scale shall be included.

11.1.2.2 Site Grading and Drainage Plans. Show locations of all sediment basins, diversion ditches, and other erosion control structures. Indicate the approximate drainage areas each will service. Indicate the materials, construction and capacity of each structure. Include limits of landscaping and seeded areas. General site grading and drainage shall be indicated by contour lines with an interval of not more than approximately 1 foot [800mm].

11.1.2.3 Road Alignment Plans. Scale shall be no greater than 1"=30' and profiles showing pavement and shoulder widths, azimuths and curve data, limits of grading, and erosion control. The materials to be used shall be indicated.

11.1.2.4 Traffic Control Plan. Traffic routing and signage shall be in accordance with The Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highways Administration.

11.1.2.5 Parking Lots. Show the actual dimensions of parking lots and measurements from a known reference point rather than coordinates at corners. Show the number of parking spaces.

11.1.2.6 Sanitary Sewer Plan. Scale shall be 1"=30' and profiles showing location and elevation of pipe, thrust blocks, manholes, etc. Materials and construction of main and appurtenances shall be indicated. Specifications shall be provided.

11.1.2.7 Water Supply Line Plans. Scale shall be 1"=30' and profiles showing locations of valves, thrust blocks, connections, etc. Materials shall be indicated and specifications shall be provided for valves, pipes, etc.

11.1.2.8 Electrical Plan Requirements.

11.1.2.8.1 Required diagrams and details on Site Electrical Drawings.

a. Off-Site Electrical Distribution Plans.
b. Off-Site Primary Circuit Routing Plans.
c. Off-Site One Line Diagrams.
d. Off-Site Woodruff Street Substation Expansion Plan.
e. Off-Site Details. (Dip Pole Line Construction, etc.)
f. On-Site Electrical Distribution Plan:
g. On-Site One Line Diagram.
h. On-Site Distribution Transformer Schedule: Provide with the following headings:
Transformer Designation.
Transformer Size (KVA).
Building(s) Served.
Primary Phase(s) and Circuit to which connected.
i. On-Site Details (Site Lighting, Trenching, Pad-Mounted Transformer, Pad-Mounted Switch, Pad-Mounted Cable Termination Cabinet, Traffic Signal Controller, Traffic Signal Lights, etc.).

11.1.9 Specifications. Provide final specifications which include all sections which apply to site/utility work.

11.1.10 Design Analysis. The design analysis shall include design calculations fully developed to support the design of the site and utility systems included in this submittal.

11.1.10.1 The design analysis shall include a Field Trip Report demonstrating coordination with the Fort Bragg Information Technology Business Center (ITBC), Fort Bragg Public Works Business Center (PWBC) Exterior Electric Shop, the local cable TV service provider and the local telephone service provider (barracks buildings). Instructions received shall be included.

11.1.10.2 The design analysis shall include all requirements included in chapter A-5 of the Savannah District Design Manual for Military Construction.

11.1.11 Geotechnical. Soils analysis and geotechnical report will be furnished by the Government with the RFP. Any additional data necessary for the design will be obtained by the Contractor. Geotechnical information must be provided to support all assumptions and design parameters utilized in the presented site/utility design as applicable.

11.2 Preliminary Conformance Review (60%) Design Submittal. The Preliminary Conformance Review (60%) design submittal shall contain, as a minimum, the following. Sustainable design requirements shall be incorporated into the drawings and specifications.

11.2.1 Landscape, Planting and Turfing.

11.2.1.1 The landscape planting design narrative shall describe the analysis of existing site conditions, including an indication of existing plant materials that are to remain on the site. The statement of concept shall indicate specific site problems related to proposed development and the rationale for proposed plant locations. The narrative shall also include a list of suggested types and sizes of plant materials which are to be used, based upon the designated functional and visual criteria.

11.2.1.2 The drawings shall be prepared at a scale which corresponds with the site layout and grading plans and, likewise, shall include reference coordinates, north arrows, graphic scales and appropriate legends. An overall planting layout shall be developed and shall include enlarged detail plans of specific areas, as needed, to clarify requirements. The proposed layout shall indicate shade trees, evergreen trees, flowering trees, shrub masses, etc., according to designated functional and visual locations of planting. A legend which also indicates sizes of plants recommended for each of the above categories shall be included. The drawings and all subsequent plans shall indicate existing and proposed buildings, paved areas, signs, light standards, transformers, dumpster areas, storm drainage system, and other structures and utilities.

11.2.1.3 Landscape, Planting and Turfing. Final design drawing(s) shall include a complete schedule of plant materials which indicates their botanical and common names, plan symbols, quantities, sizes, condition furnished, and pertinent remarks. Scale of drawing shall be prepared at 1" = 30'. Drawing shall correspond with the site layout and grading plans and reference coordinates, north arrows, graphic scales and appropriate legends. An overall planting layout shall be developed and shall include enlarged detail plans of specific areas as needed, to clarify requirements. Final design drawings, indicating proposed plants by a (+) mark for the plant location and a circle which is scaled at approximately 2/3 the ultimate growth spread (diameter) of plants, shall also include a complete schedule of plant materials which indicates botanical and common names, plan symbols, quantities, sizes, condition furnished, and pertinent remarks. Final drawings shall also include the basic details for installation of tree, shrub, and ground cover planting, as well as any other applicable details for clarification of specific project requirements.

11.2.2 Architectural.

11.2.2.1 Design narrative shall update the original architectural narrative provided with the awarded proposal as needed for design development. Changes from the original narrative and drawings shall be clearly stated and include background information and explanation for the change. In addition, the narrative shall include gutter and downspout sizing calculations. There shall also be a general statement for the rationale behind the major design decisions.

11.2.2.2 Architectural floor plans shall indicate dimensions, structural members, column lines, door numbers, room names, room numbers, floor slopes, floor drains, and detail references. Enlarged plans for toilets, stairs and other specialized areas shall be drawn to 1/4" scale and shall show any needed interior features. Rated walls shall be indicated.

11.2.2.3 Building elevations shall be updated for design development and shall show louvers, gutters and downspouts.

11.2.2.4 Building sections shall be provided showing coordination with structural system and room volumes.

11.2.2.5 Wall sections shall be provided showing typical exterior wall conditions including porches, loading docks and other special conditions.

11.2.2.6 Roof plan shall be provided showing downspout locations and any architectural features such as skylights.

11.2.2.7 Door schedule shall be provided indicating size, door and frame materials, door types (elevations), and door assembly fire ratings.

11.2.2.8 Finish schedule shall be provided indicating floor, wall and ceiling finish materials.

11.2.2.9 Fire Protection/Life Safety Plan and Analysis. Provide a preliminary plans and analysis indicating the fire protection and life safety features of the building.

11.2.3 Interior Design

11.2.3.1 Generic Furniture/Furnishings Plan. Submit generic furniture/furnishing plans for each floor showing the location and type of all furniture and furnishings as programmed by the project. Indicate by schedule which items shall be furnished and/or installed by the Contractor and which shall be furnished and/or installed by the Government.

11.2.3.2 Signage. Provide interior signage plans and message schedule. Note any special features such as changeable components. Note exterior signage locations and types on drawings. All exterior signage shall be in accordance with the Fort Bragg Installation Design Guide.
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11.2.3.3 Structural Interior Design. Provide 65 percent submittal in accordance with applicable "Interior Design Presentation Format" publication.

11.2.3.4 Comprehensive Interior Design. Provide 65 percent submittal in accordance with applicable "Interior Design Presentation Format" publication.

11.2.4 Structural Systems.

11.2.4.1 State the live loads to be used for design. Include roof and floor loads; wind loads, lateral earth pressure loads, seismic loads, etc., as applicable.

11.2.4.2 Describe the method of providing lateral stability for the structural system to meet seismic and wind load requirements. Include sufficient calculations to verify the adequacy of the method.

11.2.4.3 Furnish calculations for all principal roof, floor, and foundation members.

11.2.4.4 This submittal shall include drawings showing roof and floor framing plans as applicable. Principal members will be shown on the plans. A foundation plan shall also be furnished showing main footings and grade beams where applicable. Where beam, column, and footing schedules are used, show schedules and fill in sufficient items to indicate method to be used. Show typical bar bending diagram if applicable. Typical sections shall be furnished for roof, floor, and foundation conditions. Structural drawings for proposals and submittals shall be separate from architectural drawings.

11.2.4.5 Provide any computer analyses used. The software shall be widely accepted, commercially available programs and complete documentation of the input and output of the program must be provided.

11.2.4.6 Provide complete seismic analyses for all building structural components. Seismic calculations shall clearly demonstrate compliance with all requirements set forth in the Statement of Work.

11.2.5 Plumbing Systems.

11.2.5.1 List all references used in the design including Government design documents and industry standards.

11.2.5.2 Provide justification and brief description of the types of plumbing fixtures, piping materials and equipment proposed for use.

11.2.5.3 Prepare detail calculations for systems such as sizing of domestic hot water heater and piping and natural gas piping.

11.2.5.4 Indicate locations and general arrangement of plumbing fixtures and major equipment.

11.2.5.5 Include plan and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Piping layouts and risers should also include natural gas and meter as required, and other specialty systems as applicable.

11.2.5.6 Include equipment and fixture connection schedules with descriptions, capacities, locations, connection sizes and other information as required.

11.2.6 Fire Protection/Suppression.

11.2.6.1 Preliminary (60%) Design Submittal Requirements.

11.2.6.1.1 Design Analysis. As a minimum, RFP shall require that submittal requirements be in accordance with the DMMC, Chapters A-4, 5, and 6 for preliminary (60%) design submittals. Project fire protection design shall be complete and detailed as required for critical projects per the DMMC, Chapters A-4 and A-6. Design analysis shall include analysis for fire protection/life safety, fire suppression systems and alarm and detection systems.

11.2.6.1.2 Drawings. As a minimum, RFP shall require that submittal requirements be in accordance with the DMMC, Chapters A-4, 5, and 6 for preliminary (60%) design submittals. Project fire protection design shall be complete and detailed as required for critical projects per the DMMC, Chapters A-4 and A-6. Drawings shall include fire protection/life safety plans, fire suppression system plans and alarm and detection system plans.

11.2.6.1.3 Specifications. As a minimum, RFP shall require that submittal requirements be in accordance with the DMMC, Chapters A-4, 5, and 6 for preliminary (60%) design submittals. Specifications submitted shall be “marked up” versions such that reviewer can visually see the revisions. The proposer’s optional items shall be limited to bracketed items only.

11.2.6.2 Final (100%) Design Submittal Requirements.

11.2.6.2.1 Design Analysis. As a minimum, RFP shall require that submittal requirements be in accordance with the DMMC, Chapters A-4, 5, and 6 for final (100%) design submittals. Project fire protection design shall be complete and detailed as required for critical projects per the DMMC, Chapters A-4 and

A-6. Design analysis shall include analysis for fire protection/life safety, fire suppression systems and alarm and detection systems.

11.2.6.2.2 Drawings. As a minimum, RFP shall require that submittal requirements be in accordance with the DMMC, Chapters A-4, 5, and 6 for final (100%) design submittals. Project fire protection design shall be complete and detailed as required for critical projects per the DMMC, Chapters A-4 and A-6. Drawings shall include fire protection/life safety plans, fire suppression system plans and alarm and detection system plans.

11.2.6.2.3 Specifications. As a minimum, RFP shall require that submittal requirements be in accordance with the DMMC, Chapters A-4, 5, and 6 for final (100%) design submittals.

11.2.6.2.4 List all references used in the design including Government design documents and industry standards used to generate the fire protection analysis.

11.2.6.2.5 Classify each building in accordance with fire zone, building floor areas and height and number of stories. This information shall be contained in the fire protection analysis.

11.2.6.2.6 Discuss and provide description of required fire protection requirements including extinguishing equipment, detection equipment, alarm equipment [and water supply]. Alarm and detection equipment shall interface to requirements of electronic systems. This information shall be contained in the fire protection design analysis.

11.2.6.2.7 Prepare a plan for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. Provide the following types of information:

The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.

The location and coverage of any fire detection systems.

The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.).

The location of any other major fire protection equipment.

Indicate any hazardous areas and their classification.

11.2.6.2.8 Prepare a schedule describing the internal systems with the following information: fire hazard and occupancy classifications, building construction type, GPM/square foot sprinkler density, area of operation and other as required.

11.2.6.2.9 Hydraulic calculations based on water flow test shall be prepared for each sprinkler system to insure that flow and pressure requirements can be

met with current water supply. Include copies of contractor water flow testing done to certify the available water source.

11.2.7 Electronic Systems. Electronic Systems responsibilities include the following:

Fire Detection and Alarm System
Fire Suppression System Control
Public Address System
Telephone System
Cable Television System
Special Grounding Systems
Cathodic Protection
Intrusion Detection, Card Access System
Central Control and Monitoring System

11.2.7.1 The design analysis shall include all calculations required to support design decisions and estimates at this stage of design. The analysis shall include specific criteria furnished, conference minutes and cost analyses of all systems considered.

11.2.7.2 Design of the fire alarm and detection system shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, all zones, radio transmitter and interfaces to other systems (HVAC, sprinkler, etc.).

11.2.7.3 Specify all components of the Fire Suppression (FS) System in the FS section of the specifications. Provide a clear description of how the system will operate and interact with other systems such as the fire alarm system. Include a riser diagram on the drawings showing principal components and interconnections with other systems. Include FS system components on drawing legend. All components shown of floor plans shall be designated as FS system components (as opposed to Fire Alarm components). Show the location of FS control panels, HVAC control devices, sensors, and 120V power panel connections on the floor plans. Indicate zoning of areas by numbers (1, 2, 3) and detectors subzoned for cross zoning by letter designations (A and B). Differentiate between ceiling mounted and underfloor detectors with distinct symbols and indicate subzone of each.

11.2.7.4 Show location of telephone outlets (including pay phones) on the plans. Include legend and symbol definition to indicate height above finished floor. Show Telephone Conduit System Riser Diagram. Size conduit on Riser Diagram. Do not show conduit runs between backboard and outlets on the floor plans. Underground telephone distribution conduit shall be shown on either the electrical or electronic site plan.

11.2.7.5 Grounding System. The specifications and drawings shall completely reflect all of the design requirements. The specifications shall require field tests (in the construction phase), witnessed by the Contracting Officer, to determine the effectiveness of the grounding system. The design shall include drawings showing existing construction. Verification of the validity of any existing drawings and/or any other data furnished by the Government shall be the responsibility of the engineering services firm.

11.2.7.6 Provide a statement describing the extent of any exterior work such as telephone lines, cable television (TV) distribution cables, duct banks, etc., outside of 5 feet from the building line.

11.2.7.7 Provide the name of the licensed corrosion engineer or NACE specialist. Provide the following for cathodic protection systems:

Clearly define areas of structures or components in soil or water to be protected.
Type system recommended, comparison of systems, cost estimates showing all equipment alternatives.

Calculations on all systems that are considered showing all information and descriptions.

11.2.8 Design of Cathodic Protection. The design shall clearly provide a thorough and comprehensive specification and drawing. The design plans and specifications shall show extent of the facilities to be protected, location and type of anodes, location of test points, details for sectionalizing an underground piping system. This design shall be complete enough to purchase equipment and build without design changes to meet criteria of protection.

11.2.8.1 Exterior work to be shown on electrical site plan.

Existing and new communications service lines, both overhead and underground, shall be properly identified.

Show removals and relocations, if any.

11.2.8.2 Provide a descriptive narrative of all electronic systems that are required for project. Define any hazardous areas (as defined in the National Electric Code) and indicate the type of equipment proposed for use in such areas. Show the location of all electronic system panels, etc., on the floor plans. Show the proposed riser diagrams for all systems. Sizes of all conduit, wires, cables, panels, etc. Provide a complete symbol legend for all devices or equipment shown on the plans. For work requiring removals or demolition, the designer shall show by use of drawings or narrative, how demolition work is to be done.

11.2.9 Electrical and Mechanical Systems. Provide all information as required on the 100% design submittal developed to 60% completion.

11.2.10 Specifications. Draft of specifications for housing units, including index and trade sections.

11.3 100% DESIGN SUBMITTAL. The 100% design submittal shall contain, as a minimum, the following items for all submittals. Sustainable design requirements shall be incorporated into the drawings and specifications.

11.3.1 General. A complete set of construction documents plans and specifications at the same level of detail as if the project were to be bid including a complete list of equipment, fixtures and materials to be used.

The final drawings are an extension of the reviewed 60% drawings and are to include the 60% comments and responses. All details shall be shown on the drawings.

11.3.2 The design analysis is an extension of the reviewed 60% design analysis and supports and verifies that the design complies with the requirements of the project.

11.3.3 Submit marked up specifications. The specifications shall be coordinated with the drawings and describe in detail all items shown on the drawings.

11.3.4 Architectural.

11.3.4.1 Final drawings shall show all plans, elevations, sections, details, schedules and notes, cross-referenced, to present a complete description of the construction required. All architectural drawings shall be coordinated with the other engineering disciplines and with the specifications. Ensure that the plans are in compliance with the applicable codes. It will be the Contractor's responsibility to implement the comments generated from any design review and to verify the consistency between plans and specifications.

11.3.4.2 Floor plans shall indicate brick expansion joint and CMU control joint locations. Fire extinguisher cabinets and brackets shall be shown on floor plan. Floor tile expansion joints shall be coordinated with slab joints and shown on floor plan or floor pattern plan if used.

11.3.4.3 Enlarged plans, interior elevations and details with dimensions shall be provided as needed to demonstrate compliance with ADAAG and UFAS.

11.3.4.4 Reflected ceiling plan shall show light fixtures and mechanical supply and return air units.

11.3.4.5 Roof plan shall show all roof penetrations and roof-mounted items. Roof plan shall indicate gutter expansion joint and downspout locations. Roof details shall be at a scale large enough to clearly show flashing laps, which shall be dimensioned (3″=1′-0″ scale is recommended). All roof transition conditions shall be detailed.

11.3.4.7 Fire Protection/Life Safety Plan and Analysis. Provide updated plans and analysis indicating the fire protection and life safety features of the building.

11.3.4.8 Specifications for door hardware shall be prepared using BHMA designations.

11.3.5 Interior Design.

11.3.5.1 Implement Concept and Preliminary review comments.

11.3.5.2 Structural Interior Design. Provide 100 percent submittal in accordance with applicable "Interior Design Presentation Format" publication.

11.3.5.3 Comprehensive Interior Design. Provide 100 percent submittal in accordance with applicable "Interior Design Presentation Format" publication.

11.3.6 Structural Design.

11.3.6.1 Furnish complete checked calculations for all structural members. Incorporate any changes required by comments on 60% Design Submittal.

11.3.6.2 Prior to this submittal, structural drawings shall be coordinated with all other design disciplines.

11.3.6.3 The final structural drawings shall contain the following information as a set of general notes:

The allowable soil bearing value.
The design stresses of structural materials used.
The design live loads used in the design of various portions of the structures.
The design wind speed.
The seismic zone and the "K", "C", "I" and "Z" values used in design.

11.3.6.4 All structural drawings and calculations shall be checked and stamped by the designer of record (a registered Professional Engineer).

11.3.7 Fire Suppression System. Provide a file of the input data used in the computer program to design the fire suppression system as well as the output data.

11.3.8 Specific Mechanical and Plumbing Requirements.

11.3.8.1 Required Plans, Diagrams, Schedules and Details on Unit Mechanical Drawings.

11.3.8.1.1 Mechanical Floor Plan. The floor plans shall show all principle architectural features of the building which will affect the mechanical design. The floor plans shall also show the following:

Room designations.
Mechanical legend and applicable notes.
Location of all ductwork or piping (double line ductwork required).
Location and capacity of all terminal units (i.e., registers, diffusers, grilles, hydronic baseboards). Exhaust fan and range hood location.
Size of all ductwork and piping.
Thermostat location.
Location of heating/cooling plant (i.e., boiler, chiller, cooling tower, etc).
Location of all air handling equipment.
Return air paths (i.e., undercut doors, transfer grilles).
Flue piping size and location.
Piping diagram for forced hot water system (if used).
Fuel supply and return piping

11.3.8.1.2 Equipment Schedule. Complete equipment Schedules shall be provided. Schedule shall also include:

Capacity
Electrical characteristics
Efficiency (if applicable)
Manufacturer's name
Optional features to be provided
Physical size

11.3.8.1.3 Details. Construction details, sections, elevations, etc., shall be provided where required for clarification of methods and materials of design. Roof and exterior wall penetrations shall be detailed on the drawings.

11.3.8.2 Plumbing Floor Plan. The floor plan shall show all principal architectural features of the building which will affect the plumbing design. Separate plumbing plans will not be required if sufficient information can be shown on the mechanical plans to meet the requirements shown above. The floor plan shall also show the following:

Room designations.
Fixture Schedule.
Location of utility entrances.
Waste and water pipe location and size.
Fixture designations.

11.3.8.3 Design Analysis. Complete design calculations for mechanical systems. Include computations for sizing PM&E equipment, air duct design, and U-factors for ceilings, roofs and exterior walls and floors. Contractor shall employ commercially available energy analysis techniques to determine the energy performance of all passive systems and features. Use of hourly energy load computer simulation (e.g., TRNSYS, DOE 2.1 Blast, etc.) is required. These calculations can be used to size the mechanical systems. Based on the results of calculations, provide a complete list of the materials and equipment proposed for heating and plumbing, with the manufacturer's published cataloged product installation specifications and roughing-in data. The heating and cooling equipment data shall include the manufacturer's wiring diagrams, installation specifications, ARI certification, and the standard warranty for the equipment.

11.3.9 Specific Electrical Requirements:

11.3.9.1 Required Plans, Diagrams, Schedules, and Details on Unit Electrical Drawings.

11.3.9.1.1 Electrical Floor Plan. The floor plans shall show all principle architectural features of the building which will affect the electrical design. The floor plan shall also show the following:

Room designations.
Electrical legend and applicable notes.
Lighting fixtures, properly identified.
Location of smoke and CO detectors.
Location of telephone and cable TV outlets.

Switches/sensors for control of lighting.
Receptacles.
Location and designation of panelboards. Plans should clearly indicate type of mounting required (flush or surface) and be reflected accordingly in specifications. Service entrance (conduit and main disconnect).
Location, designation and rating of motors and/or equipment which requires electrical service. Show method of termination and/or connection to motors and/or equipment. Show necessary junction boxes, disconnects, controllers (approximate only), conduit stubs, and receptacles required to serve the motor and/or equipment.

11.3.9.1.2 Building Riser Diagram (From Pad-Mounted Transformer To Unit Load Center Panelboard). Indicate the types and sizes of electrical equipment and wiring. Include grounding and metering requirements.

11.3.9.1.3 Load Center Panelboard Schedule(s). Schedule shall indicate the following information:
Panelboard Characteristics (Panel Designation, Voltage, Phase, Wires, Main Breaker Ratingand Mounting.
Branch Circuit Designations.
Load Designations.
Circuit Breaker Characteristics. (Number of Poles, Trip Rating, AIC Rating)
Branch Circuit Connected Loads (AMPS).
Special Features.

11.3.9.1.4 Lighting Fixture Schedule. (Schedule shall indicate the following information:)

Fixture Designation.
General Fixture Description.
Number and Type of Lamp(s).
Type of Ballast.
Type of Mounting.
Special Features.

11.3.9.1.5 Details. Construction details, sections, elevations, etc., shall be provided where required for clarification of methods and materials of design.

11.3.9.2 Required Electrical Design Analysis. Design analysis and calculations for the electrical systems shall be prepared by a licensed professional engineer, and shall be stamped as such. The design analysis shall be separately bound, in one or more volumes. Show functional and engineering criteria, design information, and calculations applicable to the project. The analysis shall be organized in a format appropriate for review, approval, and record purposes. The design calculations shall indicate methods and references identified, and shall explain assumptions and conclusions.

11.3.9.2.1 The design analysis shall include a Field Trip Report demonstrating coordination with the Fort Bragg Information Technology Business Center (ITBC) and the Fort Bragg Public Works Business Center (PWBC). Instructions received shall be included.

11.3.9.2.2 The design analysis shall include all requirements included in chapter A-5 of the Savannah District Design Manual for Military Construction.

11.3.9.2.3 All interior and exterior lighting calculations shall be computer generated and shall be based on the point-by-point method. All program inputs shall be included (e.g., lamp lumens, lumen maintenance factors and ballast factors).
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11.3.9.2.4 A fault analysis and protective coordination study shall be provided for the facilities and shall extend to the supply substation. All assumptions shall be clearly stated. Calculations shall be based on actual substation fault current data obtained from the public utility or may be based on an assumed infinite bus at the substation.

11.3.10 Specifications: Provide final specifications. The Contractor shall make final identification of all materials and finishes at this stage.

11.4 Design Complete Submittal (Corrected Final).

11.4.1 Design Drawings. Drawings shall be 100% complete, signed and sealed by the designer of record. All previous review comments shall be incorporated.

11.4.2 Design Analysis. Complete design analysis for all design disciplines. The final Fire Protection and Life Safety Analysis shall be included in the Design Analysis.

11.4.3 Comment Response Package. Complete package showing all comments from all previous reviews and the respective response and disposition.

11.4.4 This submittal shall include all drawings and design information from the 100% site/utility submittal to form a complete design package.

12. DESIGN RELATED PRODUCTS

12.1 Architectural Renderings. Contractor shall provide the original and three copies of each ground level perspective artist's renderings of completed typical facilities with walks, parking, and landscaping. Renderings shall be no smaller than 14" x 18" or larger than 28" x 36", multi-colored, and shall be suitably titled, matted, and framed.
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12.2 DD Form 1354. Three sets of DD Form 1354, Transfer and Acceptance of Military Real Property shall be prepared in accordance with DA Pamphlet 415-28 available at http://www.usapa.army.mil/gils/ for each building and submitted to the Contracting Officer no later than 120 calendar days after approval of the corrected final design. The DD Form 1354 will require input from both the design agent and the Contractor. The form must be completed in English units.

12.3 Submittal Register, ENG FORM 4288. The Contractor shall complete and submit three (03) copies of a "preliminary" Eng Form 4288, Submittal Register to Contracting Officer. The "preliminary" Eng Form 4288, Submittal Register shall have the column "Submittal Identification", "Specification Paragraph

Number", "Description of Submittal" "Type of Submittal", and "Remarks" completed; the Contractor shall identify whether the submittal is for "Government Approval" or for "Government Information" under the column "Remarks."

12.4 Reproduction. Upon Government approval of 100% design documents, the original will be returned to the Contractor for reproduction purposes. The Contractor will be responsible for his own reproduction as well as reproduction for Government use. The Government will require twice the number of copies of the plans and specifications as were required for the review stages, no color boards will be required. The originals will be retained by the Contractor for recording of as-built conditions. Upon completion of the project, the original design documents corrected to reflect as-built conditions will be supplied to the Government.

13. PAYMENT DURING DESIGN

Payments, as authorized by the Authorized Representative Contracting Officer (COR), will be made monthly for the amount and value of the work and services performed by the Contractor. This estimate will be verified by the Contracting Officer utilizing the progress charts or the CONTRACTOR-PREPARED NETWORK ANALYSIS SYSTEM submitted by the Contractor and independent analyses of progress. See contract clause entitled PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS for additional information.

SECTION 01330/S
SUBMITTAL PROCEDURES
10/2000

PART 1 GENERAL

1.1 SUBMITTAL IDENTIFICATION

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

SD-02 Shop Drawings

SD-03 Product Data

SD-04 Samples

SD-05 Design Data

SD-06 Test Reports

SD-07 Certificates

SD-08 Manufacturer's Instructions

SD-09 Manufacturer's Field Reports

SD-10 Operation and Maintenance Data

SD-11 Closeout Submittals

1.2 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.2.1 Designer of Record Approved.

Designer of Record approval is required for extensions of design, critical materials, any deviations from the solicitation, the accepted proposal, or the completed design, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer's Representative. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings". The Contractor shall provide the Government the number of copies designated hereinafter of all Designer of Record approved submittals. The Government may review any or all Designer of Record approved submittals for conformance to the Solicitation and Accepted Proposal. The Government will review all submittals designated as deviating from the Solicitation or Accepted Proposal, as described below.

1.2.2 Government Approved Construction Submittals.

Administrative Contracting Officer approval is required for any deviations from the Solicitation or Accepted Proposal and other items as designated by the Contracting Officer' Representative. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", they are considered to be "shop drawings".

1.2.3 Government Reviewed Extension of Design.

Government review is required for extension of design construction submittals, used to define contract conformity, and for deviation from the completed design. Review will be only for conformance with the contract requirements. Included are only those construction submittals for which the Designer of Record design documents do not include enough detail to ascertain contract compliance. Government review is not required for extensions of design such as structural steel or reinforcement shop drawings.

1.2.4 Information Only.

All submittals not requiring Designer of Record or Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above.

1.1.5 GOVERNMENT REVIEWED OR "APPROVED" SUBMITTALS

The Contracting Officer's Representative conformance review or approval of submittals shall not be construed as a complete check, but will indicate only that the design, general method of construction, materials, detailing and other information appear to meet the Solicitation and Accepted Proposal. Government Review or approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor, under the Design and CQC requirements of this contract, is responsible for design, dimensions, all design extensions, such as the design of adequate connections and details, etc., and the satisfactory construction of all work. After submittals have been reviewed for conformance or approved, as applicable, by the Contracting Officer' Representative, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.2 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer's Representative, obtain the Designer of Record's approval, when applicable, and promptly furnish a corrected submittal in the form an number of copies specified for the initial submittal. Any "information only" submittal found to contain errors or unapproved deviations from the Solicitation or Accepted Proposal shall be resubmitted as one requiring "approval" action, requiring both Design of Record and Government approval. If the Contractor considers any correction indicated by the Government on the submittals to constitute a change to the contract, it shall promptly provide a notice in accordance with the Contract Clause "Changes" to the Contracting Officer's Representative.

1.3 WITHHOLDING OF PAYMENT

No payment for materials incorporated in the work will be made if all required Designer of Record or required Government approvals have not been obtained. No payment will be made for any materials incorporated into the work for any conformance review submittals or information only submittals found to contain errors or deviations from the Solicitation or Accepted Proposal.

PART 2 PRODUCTS (Not used)

PART 3 EXECUTION

3.1 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves; test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

3.1.1 Design Submittals

The Contractor shall provide design submittals in accordance with Section 01012 DESIGN AFTER AWARD.

3.2 SUBMITTAL REGISTER
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The Contractor's Designer(s) of Record shall develop a complete list of submittals during design. The Designer of Record shall identify required submittals in the specifications. Use the list to prepare ENG Form 4288 Submittal Register or a computerized equivalent. The list may not be all inclusive and additional submittals may be required by other parts of the contract. The Contractor is required to complete ENG Form 4288 (including columns "a" through "r") and submit to the Contracting Officer for approval within 30 calendar days after ~~Notice to Proceed~~corrected final approval of plans and specifications. A preliminary Submittal Register shall be submitted with the 100 percent site submittal. The approved submittal register will serve as a scheduling document for submittals and will be used to control submittal actions throughout the contract period. The submit dates and need dates used in the submittal register shall be coordinated with dates in the Contractor prepared progress schedule. Updates to the submittal register showing the

Contractor action codes and actual dates with Government action codes and actual dates shall be submitted monthly or until all submittals have been satisfactorily completed. When the progress schedule is revised, the submittal register shall also be revised and both submitted for approval. The Contractor shall maintain a submittal register for the project.

3.3 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 30 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals. An additional 10 calendar days shall be allowed and shown on the register for review and approval of submittals for refrigeration and HVAC control systems.

3.4 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) included in Attachment 1 to Section 00800 shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms are included in the RMS-QC software that the Contractor is required to use for this contract. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

3.5 SUBMITTAL PROCEDURE

Submittals shall be made as follows:

3.5.1 Procedures

The Contractor shall be responsible for the scheduling and control of all submittals. The Contractor is responsible for confirming that the submittal register includes all submittals required by the contract documents.

In addition to those items listed on ENG Form 4288, the Contractor will furnish submittals for any deviation from the plans or specifications. The scheduled need dates must be recorded on the document for each item for control purposes and critical items must be tied to the Contractor's approved schedule where applicable.

The Contractor will submit to the Contracting Officer for approval a minimum of five copies of all G/RE (Resident/Area Office Review), G/ED (Engineering Division Review) or G/AE (Architect-Engineer Review) level submittals. Three copies of all FIO level submittals will be provided. The number of copies of submittals specified in this portion of the contract shall be complied with in lieu of four copies as specified by FAR 52.236-21.

For those contracts requiring Network Analysis System (NAS), the Contractor will schedule on the NAS critical items of equipment submittals and procurement activities which will, or have the potential to, significantly impact project completion. The inclusion or exclusion of critical items shall be subject to the approval of the Contracting Officer. Where ENG Form 4025 must be submi tted prior to approval of the Construction Progress Schedule, the Contractor shall submit an initial annotated ENG Form 4288 upon which dates for submittal, approval and delivery of procurement items shall be included for the first 60 days of the work. Upon approval of the Construction Progress Schedule, or no later than 60 days after Notice to Proceed, the Contractor shall submit final annotated copies of ENG Form 4288. Dates shall be coordinated with the approved Construction Progress Schedule to logically interface with the sequence of construction. Critical item numbers will be shown on the listing if NAS is required.

Furnishing the schedule shall not be interpreted as relieving the Contractor of his obligation to comply with all the specification requirements for the items on the schedule. Contractor's Quality Control representative shall review the listing at least every 30 days and take appropriate action to maintain an effective system. The Contractor shall furnish a list each 30 days of all submittals on which either Government's or Contractor's action is past due. He shall also furnish revised due dates in those cases when the original submittal schedule is no longer realistic. This monthly list of delayed items shall also be annotated by the Contractor to show what corrective action he is taking with regard to slippages in submittal schedule which are attributable to actions by him, his subcontractors, or suppliers.

The Contractor shall provide a complete updated submittal register indicating the current status of all submittals when requested by the Contracting Officer in order to assure himself the schedule is being maintained.

The Contractor shall certify that each submittal is correct and in strict conformance with the contract drawings and specifications. All submittals not subject to the approval of the Contracting Officer will be submitted for information purposes only.

No Corps of Engineers action will be required prior to incorporating these items into the work, but the submittal shall be furnished to the Area/Resident Engineer not less than 2 weeks prior to procurement of Contractor certified material, equipment, etc.

These Contractor approved submittals will be used to verify that material received and used in the job is the same as that described and approved and will be used as record copies. All samples of materials submitted as required by these specifications shall be properly identified and labeled for ready identification, and upon being certified by the Contractor and reviewed by the Contracting Officer, shall be stored at the site of the work for job site use until all work has been completed and accepted by the Contracting Officer. Delegation of this approval authority to Contractor Quality Control does not relieve the Contractor from the obligation to conform to any contract requirement and will not prevent the Contracting Officer from requiring removal and replacement of construction not in contract conformance; nor does it relieve the Contractor from the requirement to furnish "samples" for testing by the

Government Laboratory or check testing by the Government in those instances where the technical specifications so prescribe.

Contractor certified drawings will be subject to quality assurance review by the Government at any time during the duration of the contract. No adjustment for time or money will be allowed for corrections required as a result of noncompliance with plans and specifications.

Submittals Requiring Government Approval (G/ED Level, G/RE Level or G/AE level). Where the review authority is designated to the Government, the Contractor is required to sign the certification on ENG Form 4025 in the box beside the remarks block in Section I. The Government will code the items in block h and sign the approval action block in Section II as the approving authority.

Operating and Maintenance Instructions. Six complete sets of instructions containing the manufacturer's operating and maintenance instructions for each piece of equipment shall be furnished. Each set shall be permanently bound and shall have a hard cover. One complete set shall be furnished at the time test procedures are submitted. Remaining sets shall be furnished before the contract is completed. The following identification shall be inscribed on the covers: The words "OPERATING AND MAINTENANCE INSTRUCTIONS," name and location of the facility, name of the Contractor, and contract number. Fly sheets shall be placed before instructions covering each subject. Instruction sheets shall be approximately 8-1/2 by 11 inches, with large sheets of drawings folded in. Instructions shall include but are not limited to:

(1) System layout showing piping, valves and controls;

(2) Approved wiring and control diagrams;

(3) A control sequence describing startup, operation and shutdown;

(4) Operating and maintenance instructions for each piece of equipment, including lubrication instructions and troubleshooting guide; and

(5) Manufacturer's bulletins, cuts and descriptive data; parts lists and recommended parts.

The Government will further discuss and detail the required submittal procedures at the Pre-Construction Conference.

3.5.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. As stated above, the Contractor’s Designer of Record approval is required for any proposed deviations. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

3.6 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

3.7 GOVERNMENT CONFORMANCE REVIEW AND APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated. Four copies of the submittal will be retained by the Contracting Officer and one copy of the submittal will be returned to the Contractor. If the Government performs a conformance review of other Designer of Record approved submittals, the submittals will be so identified and returned, as described above.

3.8 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

3.9 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR

(Firm Name)

_____ Approved
_____ Approved with corrections as noted on the submittal data and/or attached sheets.

SIGNATURE:_____

TITLE: (DESIGNER OF RECORD)

SECTION 01415

METRIC MEASUREMENTS
03/97

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM E 380	(1993) Practice for Use of the International System of Units (SI)
ASTM E 621	(1994) Practice for Use of Metric (SI) Units in Building Design and Construction

1.2 GENERAL

This project includes metric units of measurements. The metric units used are the International System of Units (SI) developed and maintained by the General Conference on Weights and Measures (CGPM); the name International System of Units and the international abbreviation SI were adopted by the 11th CGPM in 1960. A number of circumstances require that both metric SI units and English inch-pound (I-P) units be included in a section of the specifications. When both metric and I-P measurements are included, the section may contain measurements for products that are manufactured to I-P dimensions and then expressed in mathematically converted metric value (soft metric) or, it may contain measurements for products that are manufactured to an industry recognized rounded metric (hard metric) dimensions but are allowed to be substituted by I-P products to comply with the law. Dual measurements are also included to indicate industry and/or Government standards, test values or other controlling factors, such as the code requirements where I-P values are needed for clarity or to trace back to the referenced standards, test values or codes.

1.3 USE OF MEASUREMENTS

Measurements shall be either in SI or I-P units as indicated, except for soft metric measurements or as otherwise authorized. When only SI or I-P measurements are specified for a product, the product shall be procured in the specified units (SI or I-P) unless otherwise authorized by the Contracting Officer. The Contractor shall be responsible for all associated labor and materials when authorized to substitute one system of units for another and for the final assembly and performance of the specified work and/or products.

1.3.1 Hard Metric

A hard metric measurement is indicated by an SI value with no expressed correlation to an I-P value, i.e., where an SI value is not an exact mathematical conversion of an I-P value, such as the use of 100 mm in lieu of 4 inches. Hard metric measurements are often used for field data such as

distance from one point to another or distance above the floor. Products are considered to be hard metric when they are manufactured to metric dimensions or have an industry recognized metric designation.

1.3.2 Soft Metric

a. A soft metric measurement is indicated by an SI value which is a mathematical conversion of the I-P value shown in parentheses (e.g. 38.1 mm (1-1/2 inches)). Soft metric measurements are used for measurements pertaining to products, test values, and other situations where the I-P units are the standard for manufacture, verification, or other controlling factor. The I-P value shall govern while the metric measurement is provided for information.

b. A soft metric measurement is also indicated for products that are manufactured in industry designated metric dimensions but are required by law to allow substitute I-P products. These measurements are indicated by a manufacturing hard metric product dimension followed by the substitute I-P equivalent value in parentheses (e.g., 190 x 190 x 390 mm (7-5/8 x 7-5/8 x 15-5/8 inches)).

1.3.3 Neutral

A neutral measurement is indicated by an identifier which has no expressed relation to either an SI or an I-P value (e.g., American Wire Gage (AWG) which indicates thickness but in itself is neither SI nor I-P).

1.4 COORDINATION

Discrepancies, such as mismatches or product unavailability, arising from use of both metric and non-metric measurements and discrepancies between the measurements in the specifications and the measurements in the drawings shall be brought to the attention of the Contracting Officer for resolution.

1.5 RELATIONSHIP TO SUBMITTALS

Submittals for Government approval or for information only shall cover the SI or I-P products actually being furnished for the project. The Contractor shall submit the required drawings and calculations in the same units used in the contract documents describing the product or requirement unless otherwise instructed or approved. The Contractor shall use ASTM E 380 and ASTM E 621 as the basis for establishing metric measurements required to be used in submittals.

SECTION 01420

SOURCES FOR REFERENCE PUBLICATIONS
06/01

1.1 REFERENCES

Various publications are referenced in other sections of the specifications to establish requirements for the work. These references are identified in each section by document number, date and title. The document number used in the citation is the number assigned by the standards producing organization, (e.g. ASTM B 564 Nickel Alloy Forgings). However, when the standards producing organization has not assigned a number to a document, an identifying number has been assigned for reference purposes.

1.2 ORDERING INFORMATION

The addresses of the standards publishing organizations whose documents are referenced in other sections of these specifications are listed below, and if the source of the publications is different from the address of the sponsoring organization, that information is also provided. Documents listed in the specifications with numbers which were not assigned by the standards producing organization should be ordered from the source by title rather than by number. The designations "AOK" and "LOK" are for administrative purposes and should not be used when ordering publications.

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SECTION 01451

CONTRACTOR QUALITY CONTROL
04/97

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(1994a) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(1995b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with quality requirements specified in the contract. The project superintendent in this context shall mean the individual with the responsibility for the overall management of the project including quality and production.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 5 days after receipt of notice to proceed, the Contractor Quality Control

(CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (The Contracting Officer will approve Laboratory facilities.)

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

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3.2.2.1 Additional Requirements for Design Quality Control (DQC) Plan

The followng additional requirements apply to the Design Quality Control (DQC) plan:

(1) The Contractor's QCP Plan shall provide and maintain a Design Quality Control (DQC) Plan as an effective quality control program which will assure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality standards. As a minimum, all documents shall be technically reviewed by competent, independent reviewers identified in the DQC Plan. The same element that produced the product shall not perform the independent technical review (ITR). In addition, the DQC Plan shall incorporate the Lessons Learned Databases provided by the Government. The Contractor shall correct errors and deficiencies in the design documents prior to submitting them to the Government.

(2) The Contractor shall include the design schedule in the master project schedule, showing the sequence of events involved in carrying out the project design tasks within the specific contract period. This should be at a detailed level of scheduling sufficient to identify all major design tasks, including those that control the flow of work. The schedule shall include review and correction periods associated with each item. This should be a forward planning as well as a project monitoring tool. The schedule reflects calendar days and not dates for each activity. If the schedule is changed, the Contractor shall submit a revised schedule reflecting the change within 7 calendar days. The Contractor shall include in the DQC Plan the discipline-specific checklists to be used during the design and quality control of each submittal. These completed checklists shall be submitted at each design phase as part of the project documentation. Example checklists can be found in ER 1110-1-12.

(3) The DQC Plan shall be implemented by an Design Quality Control Manager who has the responsibility of being cognizant of and assuring that all documents on the project have been coordinated. This individual shall be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect. The Contractor shall notify the Contracting Officer, in writing, of the name of the individual, and the name of an alternate person assigned to the position.

The Contracting Officer will notify the Contractor in writing of the acceptance of the DQC Plan. After acceptance, any changes proposed by the Contractor are subject to the acceptance of the Contracting Officer.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 7 calendar days prior to the Coordination Meeting. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 General

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure contract compliance. The Contractor shall provide a CQC organization which shall be at the site at all times during progress of the work and with complete authority to take any action necessary to ensure compliance with the contract. All CQC staff members shall be subject to acceptance by the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of

CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a graduate engineer or a graduate of construction management, with a minimum of 10 years construction experience on construction similar to this contract. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned no other duties. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

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In addition to CQC personnel specified elsewhere in the contract, the Contractor shall provide as part of the CQC organization specialized personnel to assist the CQC System Manager for the following areas: electrical, mechanical, civil, and submittals clerk, and dedicated engineer for design. These individuals shall be directly employed by the prime contractor; be responsible to the CQC System Manager; be physically present at the construction site during work on their areas of responsibility; have the necessary education and/or experience in accordance with the experience matrix listed herein. These individuals shall have no duties other than quality control and shall be physically present at the construction site during work on their areas of responsibility. ~~or no later than 60 days after Notice to Proceed, whichever is earlier.~~ **The CQC System Manager shall be employed and functioning in the position no later than 30 days prior to the start of construction. Other CQC personnel shall be employed and functioning as part of the CQC staff no later than 30 days prior to the start of construction in their area of responsibility. The dedicated engineer for design shall be employed and functioning as CQC for design no later than 30 days after NTP and shall remain in the position until all design work has been completed and approved by the government.**

Experience Matrix

Area	Qualifications
*4	
a. Civil	Graduate Civil Engineer with 3 years' experience in the type of work being performed on this project or a technician with 10 years' ~~related~~ experience
b. Mechanical	Graduate Mechanical Engineer with 3 years' experience or person with 10 years' related experience
c. Electrical	Graduate Electrical Engineer with 3 years' related experience or person with 10 years' related experience
*8	
d. ~~Dedicated Engineer for~~ Design Quality Control Manager	~~Graduate~~ Professional Engineer or Registered

	Architect with 10 years' experience. Can be employed by AE firm of prime contractor.
e. Submittals	Submittals Clerk with 2 years' experience

3.4.4 Additional Requirement

In addition to the above experience and education requirements the CQC System Manager or the principal member of the CQC staff shall have completed the course entitled "Construction Quality Management For Contractors." This course is periodically offered on a quarterly basis within the Savannah District boundaries. CQC System Managers who have not successfully completed this course must attend the next available training session. Failure to successfully complete this training within the next available training date will be grounds for removal as CQC System Manager. There is currently a nominal fee to cover the cost of the training materials for Contractors who have current contracts with the Savannah District.

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS

Submittals shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

a. A review of each paragraph of applicable specifications.

b. A review of the contract drawings.

c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.

d. Review of provisions that have been made to provide required control inspection and testing.

e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.

f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.

*4

g. A review of the appropriate activity hazard analysis to assure safety and health requirements are met.

h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.

i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.

j. Discussion of the initial control phase.

k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.

b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.

c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.

d. Resolve all differences.

*4

e. Check safety and health to include compliance with and upgrading of the safety and health plan and activity hazard analysis. Review the activity analysis with each worker.

f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall

be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.

g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, onsite production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

a. Verify that testing procedures comply with contract requirements.

b. Verify that facilities and testing equipment are available and comply with testing standards.

c. Check test instrument calibration data against certified standards.

d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.

e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be

submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed a charge to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the following address:

US Army Engineer District, Savannah
Environmental & Materials Unit
200 North Cobb Parkway
Building 400, Suite 404
Marietta, GA 30062

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the completion of all work or any increment thereof established by a completion time stated in the Special Clause entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a punch list of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be

corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform this inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at this inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

a. Contractor/subcontractor and their area of responsibility.

b. Operating plant/equipment with hours worked, idle, or down for repair.

c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.

d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control

phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.

e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.

f. Submittals reviewed, with contract reference, by whom, and action taken.

g. Off-site surveillance activities, including actions taken.

h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.

i. Instructions given/received and conflicts in plans and/or specifications.

j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms are enclosed at the end of Section 00800.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

CEGS-01500/S (February 1997)

SECTION 01500

TEMPORARY CONSTRUCTION FACILITIES
02/97

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

1.1.1 Site Plan

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor, the number of trailers to be used, avenues of ingress/egress to the fenced area and details of the fence installation. Any areas that may have to be graveled to prevent tracking of mud shall also be identified. The Contractor shall also indicate if the use of a supplemental or other staging area is desired.

1.1.2 Identification of Employees

The Contractor shall be responsible for furnishing to each employee, and for requiring each employee engaged on the work to display, identification as approved and directed by the Contracting Officer. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee. When required, the Contractor shall obtain and provide fingerprints of persons employed on the project. Contractor and subcontractor personnel shall wear identifying markings on hard hats clearly identifying the company for whom the employee works.

This military installation requires the following information to remain on file throughout the life of this contract. Provide the following information to the Contracting Officer at the Pre-work and/or Pre-Construction meeting.

Contract No.
Contractor Name
Contractor Mailing Address
POC for Contractor (Name) and Phone No.
POC for Contract (COE or Installation) and Phone No.
Installation that Contractor needs access; i.e. Hunter or Stewart

This requirement applies to construction firms, design AE firms, consultants and studies firms. Prescribed identification shall immediately be delivered to the Contracting Officer for cancellation upon release of any employee.

1.1.3 Employee Parking

Contractor employees shall park privately owned vehicles in an area designated by the Contracting Officer. This area will be within reasonable walking distance of the construction site. Contractor employee parking shall not interfere with existing and established parking requirements of the military installation.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Termiticide Application Report; G, RE

Completed Fort Bragg Termiticide Application Report (no form number) for each structure receiving termiticide treatment.

1.3 AVAILABILITY AND USE OF UTILITY SERVICES

1.3.1 Payment for Utility Services

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As specified in the contract the Government will make all reasonably required utilities available to the Contractor from existing outlets and supplies. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to and paid for by the Contractor at the prevailing rates. The rates listed below are current as of January 1, 2003~~October 2002~~ and are subject to change. The Contractor shall carefully conserve all utilities furnished.

1.3.2 Meters and Temporary Connections

The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall provide and maintain necessary temporary connections, distribution lines, and meters required to measure the amount of each utility used for the purpose of determining charges. The Contractor shall notify the Contracting Officer's Representative, in writing, 10 working days before the temporary connection is made. The Contracting Officer's Representative will then provide the Contractor with the name and phone number of the utility provider. The Contractor will be responsible for contacting the utility provider and making arrangements for connections and billing. For temporary electrical connections the applicable utility provider will provide the meter (meter base provided by contractor) and make the final hot connection after inspection and approval of the Contractor's temporary wiring installation. The Contractor shall not make the final electrical connection. For temporary water and sewer connections the contractor will provide the meter and after inspection/approval by the Contracting Officer's Representative make the final connection at the contractor's expense.

1.3.3 Use of Permanent Building Utility Connections

Utilities consumed by the contractor from permanent building utility connections shall also be metered and paid for by the Contractor. When the permanent system is activated the initial meter reading shall be recorded and reported as specified below. On building renovation projects the initial meter reading shall be recorded when the contractor is given possession of the building to perform the work. The Contractor shall pay for utilities consumed through the permanent building connection until the

work has been completed or the government has occupied the facility, which ever occurs first.

1.3.4 Initial Meter Readings

Upon installation of the meter, the initial reading shall be recorded (in the presence of the Contracting Officer's Representative) and forwarded to the point of contact for utility service with a copy to the Contracting Officer's Representative.

1.3.5 Final Meter Reading

Before completion of the work and final acceptance of the work by the Government, the Contractor shall notify the Contracting Officer and the applicable utility provider, in writing, 10 working days before termination is desired. The Government or applicable utility provider will take a final meter reading. The provider will disconnect electric service. Water and sewer connections will be disconnected by the contractor, at his expenses and by a method approved by the Contracting Officer's Representative. The Contractor shall then remove all the temporary distribution lines, meters, meter bases, and associated paraphernalia. The Contractor shall pay all outstanding utility bills before final acceptance of the work by the Government.

1.3.6 Requirement for Backflow Prevention on Temporary/Permanent Potable Water Connections

The Contractor shall install a backflow prevention device on all connections to the potable water system. The backflow prevention device shall be a reduced pressure or double check type, meeting all the State code requirements for backflow preventers on potable water. If the Contractor requests the use of a fire hydrant and receives approval from the Contracting Officer's Representative a backflow prevention device and meter shall be installed prior to each use.

1.3.7 Utilities Charge Rates
*4

Water ----------	$1.958570 per 1,000 gallons
Electricity ------	$0.07520657 per KW hour
Sewer ----------	$10.00/month for each connected trailer up to single wide size. The rate for larger trailers will be determined by the utility provider; however, this rate will not exceed $20.00/month per trailer.

1.4 BULLETIN BOARD, PROJECT SIGN, AND PROJECT SAFETY SIGN

1.4.1 Bulletin Board

Immediately upon beginning of work, the Contractor shall provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, a copy of the wage decision contained in the contract, Wage Rate Information poster, and other information approved by the Contracting Officer. The bulletin board shall be located at the project site in a conspicuous place easily accessible to all employees, as approved by the Contracting Officer. Legible copies of the aforementioned data shall be displayed until work is

completed. Upon completion of work the bulletin board shall be removed by and remain the property of the Contractor.

1.4.2 Project Signs

The Contractor shall furnish and install a project sign at the location selected by the Contracting Officer. The project sign shall be painted on 1/2 inch thick exterior grade plywood. The sign layout shall be in accordance with the graphic format shown in Attachment 1 to Section 00800.

1.5 PROTECTION AND MAINTENANCE OF TRAFFIC

During construction the Contractor shall provide access and temporary relocated roads as necessary to maintain traffic. The Contractor shall maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the Contracting Officer. Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment and the work, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the State and local authorities having jurisdiction. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the site shall interfere as little as possible with public traffic. The Contractor shall investigate the adequacy of existing roads and the allowable load limit on these roads. The Contractor shall be responsible for the repair of any damage to roads caused by construction operations.

1.5.1 Haul Roads

The Contractor will be required to use the haul routes shown on the plans unless otherwise permitted in writing by the Contracting Officer. When haul routes are not designated on the plans, the Contractor must obtain approval of the Contracting Officer of haul routes he intends to use. The Contractor shall maintain the haul routes and shall keep the dust problem under control by wetting the surface as needed. Sweeping and cleaning of pavements will be done as necessary to remove spillage resulting from the hauling operations. After all hauling has been completed, the Contractor shall restore the earth areas used for the haul routes to original condition by final grading, shaping, compacting, and grassing, and shall clean and sweep all paved areas as required. Any pavement damaged as a result of hauling operations under this contract for both the earth and other materials shall be promptly repaired by the Contractor, as approved by the Contracting Officer. The cost of maintenance and repair of the haul routes, as mentioned above, shall be considered as a subsidiary obligation of the Contractor. The axle load of earth hauling equipment operating on paved streets shall not exceed 18,000 pounds.

1.5.2 Barricades

The Contractor shall erect and maintain temporary barricades to limit public access to hazardous areas. Such barricades shall be required whenever safe public access to paved areas such as roads, parking areas or sidewalks is prevented by construction activities or as otherwise necessary to ensure the safety of both pedestrian and vehicular traffic. Barricades shall be securely placed, clearly visible with adequate illumination to provide sufficient visual warning of the hazard during both day and night.

1.6 CONTRACTOR'S TEMPORARY FACILITIES

1.6.1 Administrative Field Offices

The Contractor shall provide and maintain administrative field office facilities within the construction area at the designated site. Government office and warehouse facilities will not be available to the Contractor's personnel.

1.6.2 Storage Area

The Contractor shall construct a temporary 6-foot high chain link fence around trailers and materials. The fence shall include plastic strip inserts, colored brown, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Trailers, materials, or equipment shall not be placed or stored outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the Contracting Officer away from the vicinity of the construction site but within the military boundaries. Trailers, equipment, or materials shall not be open to public view with the exception of those items which are in support of ongoing work on any given day. Materials shall not be stockpiled outside the fence in preparation for the next day's work. Mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment, shall be parked within the fenced area at the end of each work day.

1.6.3 Supplemental Storage Area

Upon Contractor's request, the Contracting Officer will designate another or supplemental area for the Contractor's use and storage of trailers, equipment, and materials. This area may not be in close proximity of the construction site but shall be within the military boundaries. Fencing of materials or equipment will not be required at this site; however, the Contractor shall be responsible for cleanliness and orderliness of the area used and for the security of any material or equipment stored in this area. Utilities will not be provided to this area by the Government.

1.6.4 Appearance of Trailers

Trailers utilized by the Contractor for administrative or material storage purposes shall present a clean and neat exterior appearance and shall be in a state of good repair. Trailers which, in the opinion of the Contracting Officer, require exterior painting or maintenance will not be allowed on the military property.

1.6.5 Maintenance of Storage Area

Fencing shall be kept in a state of good repair and proper alignment. Should the Contractor elect to traverse, with construction equipment or other vehicles, grassed or unpaved areas which are not established roadways, such areas shall be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways; gravel gradation shall be at the Contractor's discretion. Grass located within the boundaries of the construction site shall be mowed for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers shall be edged or trimmed neatly.

1.6.6 New Building

In the event a new building is constructed for the temporary project field office, it shall be a minimum 12 feet in width, 16 feet in length and have a minimum of 7 feet headroom. It shall be equipped with approved electrical wiring, at least one double convenience outlet and the required switches and fuses to provide 110-120 volt power. It shall be provided with a work table with stool, desk with chair, two additional chairs, and one legal size file cabinet that can be locked. The building shall be waterproof, shall be supplied with heater, shall have a minimum of two doors, electric lights, a telephone, a battery operated smoke detector alarm, a sufficient number of adjustable windows for adequate light and ventilation, and a supply of approved drinking water. Approved sanitary facilities shall be furnished. The windows and doors shall be screened and the doors provided with dead bolt type locking devices or a padlock and heavy duty hasp bolted to the door. Door hinge pins shall be non-removable. The windows shall be arranged to open and to be securely fastened from the inside. Glass panels in windows shall be protected by bars or heavy mesh screens to prevent easy access to the building through these panels. In warm weather, air conditioning capable of maintaining the office at 50 percent relative humidity and a room temperature 20 degrees F below the outside temperature when the outside temperature is 95 degrees F, shall be furnished. Any new building erected for a temporary field office shall be maintained by the Contractor during the life of the contract and upon completion and acceptance of the work shall become the property of the Contractor and shall be removed from the site. All charges for telephone service for the temporary field office shall be borne by the Contractor, including long distance charges up to a maximum of $75.00 per month.

1.6.7 Security Provisions

Adequate outside security lighting shall be provided at the Contractor's temporary facilities. The Contractor shall be responsible for the security of its own equipment; in addition, the Contractor shall notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

1.7 OMITTED

1.8 PLANT COMMUNICATION

Whenever the Contractor has the individual elements of its plant so located that operation by normal voice between these elements is not satisfactory, the Contractor shall install a satisfactory means of communication, such as telephone or other suitable devices. The devices shall be made available for use by Government personnel.

1.9 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, the Contractor shall furnish and erect temporary project safety fencing at the work site. The safety fencing shall be a high visibility orange colored, high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on maximum 10-foot centers, constructed at the approved location. The safety fencing shall be maintained by the Contractor

during the life of the contract and, upon completion and acceptance of the work, shall become the property of the Contractor and shall be removed from the work site.

1.10 OMITTED

1.11 TERMITICIDE APPLICATION REPORT

A Termiticide Application Report (no form number) shall be completed for each structure receiving termiticide treatment. The Contractor shall obtain the form from the Fort Bragg PWBC pest management coordinator through the Contracting Officer. All requested information shall be provided in detail. The location of application shall be clearly designated, e.g., building number, name, or address. If necessary, provide a map showing location of structure with the report.

1.12 INSTALLATION REGULATIONS

The employees of the Contractor will be required to abide by all installation regulations as published by the Commanding Officer. A copy of these regulations can be obtained from the Area/Resident Engineer at the installation. All costs in connection therewith shall be included in the contract price for the work. All costs in connection therewith shall be included in the contract price for the work.

1.13 TESTING LABORATORIES

Testing is required to be performed by the Contractor as part of his Quality Control Program to verify contract compliance. This Quality Control Testing is to be conducted by a project or commercial laboratory which has been found adequate and qualified by a Corps of Engineers Division Laboratory Inspection Team.

1.13.1 Approved Testing Laboratories

A composite listing of approved testing laboratories within the Savannah District is available upon request. The Contractor should engage the services of a laboratory contained in the composite list. Contractors may obtain the list by calling (678) 354-0310. Fax requests can be made to number (678) 354-0330.

1.13.2 Other Laboratory Services

The Contractor may engage the services of a laboratory other than those approved by Corps of Engineers District Laboratory Inspection Team if they comply with the following:

a. The Contractor identifies and proposes the unapproved laboratory a minimum of 90 days prior to the start of testing. This time is necessary to allow for scheduling an inspection by a Corps of Engineers District Laboratory team. The time for Government inspection will not be the basis for an increase in the contract performance period.

b. All costs of Government inspection shall be the responsibility of the Contractor.

c. The Contractor may request Government inspection and approval prior to award by forwarding a written request to:

US Army Engineer District, Savannah
Environmental and Materials Unit
200 North Cobb Parkway
Building 400, Suite 404
Marietta, GA 30062

1.14 OMITTED

1.15 ENVIRONMENTAL EVALUATION FOR SITE CONTAMINATION - CATEGORY I

1.15.1 Site Evaluation

The job site has been evaluated for potential site contamination. The site is located in a traditionally nonhazardous location. The installation has no reason to suspect contamination.

1.15.2 Contractual Responsibilities of All Parties in the Event of Encounter with Contamination

If the Contractor encounters materials or conditions which indicate that there may be contamination on the site, the Contractor shall stop all work on the job site and report the discovery of the contaminants to the Contracting Officer's Representative (COR). The COR, will issue a written order to the Contractor to resume work or to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government as provided in FAR 52.212-12 - SUSPENSION OF WORK. The Government will be responsible for making an assessment of the contaminated site if this course of action is determined to be appropriate. After the assessment has been completed, the Government reserves the right to the following courses of action:

a. Direct the Contractor to resume work.

b. Clean up the contaminated site prior to directing the Contractor to resume work. The COR will determine whether the cleanup is to be accomplished by others or the Contractor.

c. Relocate the project site.

d. Terminate the contract for the convenience of the Government as provided in FAR 52.249-1 - TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM) or FAR 52.249-2 - TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) - ALTERNATE I as applicable.

1.16 OMITTED
1.17 OMITTED
1.18 OMITTED
1.19 OMITTED

1.20 CONSTRUCTION SCHEDULE RESTRAINTS - FORT BRAGG, NC

1.20.1 Occupancy

The work to be performed is to be accomplished in facilities which will be unoccupied and vacant during the course of construction. It is the intent of these provisions to provide for maximum coordination between construction activities pursuant to this contract and concurrent ongoing routine activities of base personnel. Interference with and inconvenience to the occupants or routine of the facility shall be held to an absolute minimum.

1.20.2 Protection

Contractor is responsible to provide such covering, shields and barricades as are required to protect building occupants, equipment, stores, supplies, etc., from dust, debris, weather intrusion, water, moisture or other cause of damage resulting from construction.

1.20.3 Phasing and Sequence

In addition to the submittals required by clause SCHEDULES FOR CONSTRUCTION CONTRACTS (see SECTION 00700, FAR 52.236-15) the Contractor shall submit for approval a summary work schedule setting forth schedule dates for initiation and completion of construction in each work area. No work shall be performed prior to approval of this schedule and all work shall be performed in strict adherence thereto. If departures from this schedule appear to be required or desired, the Contracting Officer shall be promptly notified and his approval will be required prior to implementation of said departure(s).

1.20.4 Time of Performance

1.20.4.1 Access to Buildings

All work requiring access to building interiors excluding attics, crawl spaces, etc., and all other work shall be performed between 7:30 a.m. and 4 p.m. (normal working hours for base where project is located) excluding official holidays, unless otherwise indicated or approved by the Contracting Officer. Requests to work during other than these normal hours shall be made in writing at least 48 hours in advance. For example, a request to work on a Saturday shall be submitted no later than Thursday at noon.

1.20.4.2 Work Requiring Outages

*8

Work requiring outages of utilities or building systems will be accomplished during normal working hours, during non-work hours, at night, on weekends and/or on holidays in accordance with prior approved schedule(s). Time and date of outages will be coordinated with Base maintenance personnel and personnel of facilities affected by the outage to minimize the impact on their operations as much as possible. Reasonable consideration will be given to the number of base maintenance and contractor personnel required to be present during the outage when determining the date and time of an outage.~~Work requiring outages of utilities or building systems will be accomplished during normal working hours in accordance with prior approved schedule(s).~~

1.20.5 Contractor Vehicle/Equipment Access to Fort Bragg

All Contractor-owned and privately owned vehicles requiring access to Fort Bragg on a regular basis are required to be registered. Vehicles not registered will have limited access points to the installation and will be searched. Registration procedures will be in accordance with Fort Bragg Regulation 190-5. Registration for privately owned vehicles will require a letter from the General Contractor for each individual employee and vehicle needing registration. Passes for subcontractor employees will have to have letters from the General Contractor. The format of the letter is in Appendix B of FB Regulation 190-5 and is also available in MS-Word format from the Corps of Engineers Field Office. Registration for Contractor owned vehicles requires a sponsorship letter from the Area Engineer. The format for the sponsorship letter is in Appendix C of FB Regulation 190-5 and is also available in MS-Word format from the Corps of Engineers Field Office. The Contractor shall prepare the sponsorship letters for each vehicle and submit them to Corps of Engineers Quality Assurance Representative to obtain required signature. The Quality Assurance Representative will return them after they have been signed. Once a General Contractor letter or sponsorship letter has been obtained the vehicle driver must go to the registration center, Building 8-1078, on Randolph Street to register the vehicle. To register the driver must bring a drivers license, State registration, proof of insurance, and proof of SSN if not on drivers license. The driver will have to complete FB Form 2229 'Vehicle Registration Worksheet' which is available at the registration center. Drivers will also have to sign an agreement for a criminal background check.

Contractor-owned vehicles will be given a temporary pass that can only be used by the registered driver/vehicle combination. All trucks larger than a pickup are only allowed access through Access Control Points #8 (Knox Street) and #1 (Long Street). See the Fort Bragg Vicinity Map for locations of other access points.

1.20.6 Outages

Contractor's work requiring outages of utility systems or building systems will require 2 weeks' advance notice and will be subject to the approval of the Contracting Officer. Contractor will be held responsible for unauthorized utility disruptions that cause damage or loss to the Government's real property, equipment, or operations. The Contractor will be held responsible for utility disruptions that extend beyond this period.

Limits of Duration:

Water ---------- 4 hours
Sewer ---------- 4 hours
Electricity ---------- 4 hours
Natural Gas: Seasons to be determined by Fort Bragg PWBC
  During heating season -- 3 hours
  During cooling season -- 6 hours
LP Gas: Seasons to be determined by Fort Bragg PWBC
  During heating season -- 3 hours
  During cooling season -- 6 hours
#2 Fuel Oil: Seasons to be determined by Fort Bragg PWBC
  During heating season -- 3 hours
  During cooling season -- 6 hours

High Temperature Water (HTW): Seasons to be determined by Fort Bragg PWBC
During heating season -- 3 hours
During cooling season -- 6 hours
Steam: Seasons to be determined by Fort Bragg PWBC
During heating season -- 3 hours
During cooling season -- 6 hours
Chilled Water: Seasons to be determined by Fort Bragg PWBC
During heating season -- 3 hours
During cooling season -- 6 hours

*The cooling season at Fort Bragg is 1 May through 1 October. The heating season at Fort Bragg is 1 October through 1 May.

The Contractor shall provide temporary utilities systems for any utility outage longer than the limits of duration shown above.

1.20.7 Continuity

All tools, labor and materials required to complete any item of work within a given work area or requiring an outage of any building utility or system, shall be available at the site prior to commencement thereof. Once work has commenced on an item of work, said work shall be continuously and diligently performed to completion and acceptance. Breaks in work to be negotiated with the Contracting Officers Representative if other then Holidays.

1.20.8 Permits

1.20.8.1 Excavation Permits

An Excavation Permit, FB Form 1605, shall be presented to the Resident Engineer and approved by the Facilities Engineer 7 working days prior to any excavation that penetrates the ground by 6 or more inches. A sample of this form is included in Attachment 1 to Section 00800 or can be obtained from the Resident Office upon request. The Contractor shall contact the Resident Engineer's Office for an appointment for spotting of utility lines. A signed copy of the digging permit shall be kept on site at all times.

1.20.8.2 Disposal Permits

A permit is required to use the installation land clearing and inert debris and demolition landfills. Landfill permits shall be processed with the Environmental Branch of the PWBC Environmental and Natural Resources Division through the Contracting Officer. Permits are issued for the life of the specific contract only. Only materials produced on the project for which the permits are issued may be disposed of in the land clearing and inert debris and demolition landfills. The Contractor shall keep a copy of the completed permit with the vehicle throughout the contract disposal operation. Copies of the disposal permit forms will be provided at the Preconstruction Conference. The land clearing and inert debris and demolition debris disposal site locations are shown on the drawings.

1.20.8.3 Borrow Permits

A permit is required to use the Fort Bragg borrow material pits. Borrow pit permits shall be processed with the Environmental Branch of the PWBC Environmental and Natural Resources Division through the Contracting

Officer. Permits are issued for the life of the specific contract only. Borrow materials may only be used on the project for which the permits are issued. The Contractor shall keep a copy of the completed permit with the vehicle throughout the contract borrow operation. Copies of the borrow permit forms will be provided at the Preconstruction Conference. The borrow pit location is shown on the drawings.

1.20.9 Road and/or Railroad Closures

Road and/or railroad closures will require 2 weeks' advance written notice and be subject to the Contracting Officer's approval. Notice shall state reason for closure, date and time closure will commence and estimated duration of closure. A sketch shall be provided showing location of excavated area and placement of barricades and signs. Closures shall be limited to a maximum of 5 calendar days. Kendenburg Street, Ardennes Road, and 6th Street from Kendenberg Street to Gruber Road are closed all year round Monday through Friday between the hours of 6:30 a.m. and 7:45 a.m.

1.20.10 Omitted

1.20.11 Landforms

Contractor will be required to maintain existing landforms, drainage patterns, and healthy, mature vegetation to the maximum extent possible and will replace damaged vegetation, sod, and ground cover.

1.20.12 Topsoil

Any suitable topsoil stripped from the site during the course of work will be stockpiled onsite for reuse. Any excess topsoil remaining upon completion of project will be stockpiled in the DPW compound.

1.20.13 Unforeseen Site Conditions

Any unforeseen site conditions, unmapped utility systems, or historical/archeological items encountered during site surveys, soil borings, or construction excavation will be reported to the Contracting Officer.

1.20.14 Replacement

The Contractor shall be held responsible for the replacement of any utility systems, facilities, or Government equipment damaged during the course of the contract.

1.20.15 Mowing

The Contractor will mow the grass on the construction site weekly or when the following conditions warrant: centipede grass will be maintained to a maximum height of 2 inches and a minimum height of 1 inch; all other grasses will be mowed to keep the height of the grass to a maximum of 4 inches and a minimum of 2 inches.

1.20.16 Communications Systems

The Director of Information Management will be notified through the Contracting Officer's Representative of the preparatory meeting for the communications system.

1.21 OMITTED
1.22 OMITTED
1.23 OMITTED
1.24 OMITTED
1.25 OMITTED
1.26 OMITTED

1.27 COLOR BOARDS

Six sets of color boards shall be submitted, in addition to samples required elsewhere. Such submittals shall be made not later than 60 days prior to approval date required to achieve compliance with approved project schedule. Each set of boards shall include samples of colors and finishes of all exterior and interior building surfaces such as walls, toilet partitions, floors and ceilings. The samples will be presented on 8-inch by 10-1/2-inch boards (modules) with a maximum spread of 24 inches by 31-1/2 inches for foldouts. The modules shall be designed to fit in a standard looseleaf, three-ring binder. If more space is needed, more than one board per set may be submitted. The Contractor shall certify that he has reviewed the color samples in detail and that they are in strict accordance with the contract drawings and specifications, except as may be otherwise explicitly stated. If multiple material and finish (color) schemes are required, samples shall be identified by scheme and coordinated to room names and numbers shown on the architectural floor plans and room finish and color schedule. Submittal of the color boards shall not relieve the Contractor of the responsibility to submit the samples required by technical specifications.

1.28 OMITTED
1.29 OMITTED

1.30 REQUEST FOR INFORMATION (RFI) SYSTEM

The Government has developed an electronic database, the Request for Information (RFI) System, to track and answer Contractor questions and requests for information and clarification during construction. The use of the RFI System for all requests (the Contractor's as well as the subcontractors'/suppliers') is a contractual requirement for this project. The Contractor will enter the system over the Internet using any WEB browser and any Internet service provider. The Government will provide the Contractor a user identification and password for the system that will only allow the Contractor to enter and view the requests for this project. The Contractor will provide the Government the E-mail address for the individual(s) inputting into the system in order that E-mail messages can be sent from the Government to the Contractor indicating a response to the request. The Government will provide training in the use of the software, which is a Lotus NOTES application. The Contractor will enter all requests indicating the question, recommended solution (if applicable), and needed response date. The Government will be notified through an E-mail message that the Contractor has entered a request into the system. When the Government has answered the request, an E-mail message will be sent to the Contractor, informing the Contractor that the answer to the request is in

the system. The Contractor will enter the system to retrieve the answer using the same procedure to enter the question. The RFI System assigns a unique number to each request. The Contractor will not be reimbursed separately for the required use of this system. The Contractor shall include any costs associated with the use of this system into the appropriate bid item.

1.31 PROGRESS PHOTOGRAPHS

The Contractor shall, during the progress of the project, furnish the Contracting Officer progress photographs and color slides to depict progress of construction. The photographic work shall be performed by a qualified, established, commercial photographer. The photographs and slides shall be taken between the 1st and 5th day of each month and be delivered to the Contracting Officer not later than the 20th day of the same month taken. The photographs and slides shall be taken from not less than six positions for each month as selected by the Contracting Officer. They shall show, inasmuch as practicable, work accomplished during the previous month. The photographs shall be 8-inch by 10-inch color glossy prints and the slides 35 millimeter color slides. Each photograph shall be identified showing date made, contract title and number and a brief description of work depicted and shall be sequentially numbered. The identifying data shall be placed on the back of the prints. Slides shall have a number placed on the frame corresponding to the appropriate identified print, the name of the project, the date and a brief description of work depicted. No identifying data shall appear on the face of prints or in the viewing area of slides. One copy of each photograph and the corresponding negative and slide shall be furnished to the Contracting Officer by the time stipulated above. No separate payment will be made for these services and all costs in connection therewith shall be considered incidental to costs of the overall project.

1.32 CLEANUP

Construction debris, waste materials, packaging material and the like shall be removed from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways shall be cleaned away. Materials resulting from demolition activities which are salvageable shall be stored within the fenced area described above or at the supplemental storage area. Stored material not in trailers, whether new or salvaged, shall be neatly stacked when stored.

1.33 RESTORATION OF STORAGE AREA

Upon completion of the project and after removal of trailers, materials, and equipment from within the fenced area, the fence shall be removed and will become the property of the Contractor. Areas used by the Contractor for the storage of equipment or material, or other use, shall be restored to the original or better condition. Gravel used to traverse grassed areas shall be removed and the area restored to its original condition, including top soil and seeding as necessary.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

SECTION 01572A

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT
04/01

PART 1 GENERAL

1.1 GOVERNMENT POLICY

Government policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy the Contractor shall: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse.

1.2 MANAGEMENT

The Contractor shall take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste consideration shall be given to the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. The Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling shall accrue to the Contractor. Firms and facilities used for recycling, reuse, and disposal shall be appropriately permitted for the intended use to the extent required by federal, state, and local regulations.

1.3 PLAN

A waste management plan shall be submitted within 15 days after contract award and prior to initiating any site preparation work. The plan shall include the following:

a. Name of individuals on the Contractor's staff responsible for waste prevention and management.

b. Actions that will be taken to reduce solid waste generation.

c. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas and equipment to be used for processing, sorting, and temporary storage of wastes.

d. Characterization, including estimated types and quantities, of the waste to be generated.

e. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.

f. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity.

g. List of specific waste materials that will be salvaged for resale, salvaged and reused, or recycled. Recycling facilities that will be used shall be identified.

h. Identification of materials that cannot be recycled/reused with an explanation or justification.

i. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

1.4 RECORDS

Records shall be maintained to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. The records shall be made available to the Contracting Officer during construction, and a copy of the records shall be delivered to the Contracting Officer upon completion of the construction.

1.5 COLLECTION

The necessary containers, bins and storage areas to facilitate effective waste management shall be provided and shall be clearly and appropriately identified. Recyclable materials shall be handled to prevent contamination of materials from incompatible products and materials and separated by one of the following methods:

1.5.1 Source Separated Method.

Waste products and materials that are recyclable shall be separated from trash and sorted into appropriately marked separate containers and then transported to the respective recycling facility for further processing.

1.5.2 Co-Mingled Method.

Waste products and recyclable materials shall be placed into a single container and then transported to a recycling facility where the recyclable materials are sorted and processed.

1.5.3 Other Methods.

Other methods proposed by the Contractor may be used when approved by the Contracting Officer.

1.6 DISPOSAL

Except as otherwise specified in other sections of the specifications, disposal shall be in accordance with the following:

1.6.1 Reuse.

First consideration shall be given to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Sale or donation of waste suitable for reuse shall be considered. Salvaged materials, other than those specified in other sections to be salvaged and reinstalled, shall not be used in this project.

1.6.2 Recycle.

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Waste materials not suitable for reuse, but having value as being recyclable, shall be made available for recycling whenever economically feasible. The installation has requested that all unpainted concrete be delivered to the Lamont Landfill and segregated from general C&D waste materials. Contractor shall ensure that concrete from subsurface pipes segregated for recycling does not contain asbestos.

1.6.3 Waste.

Materials with no practical use or economic benefit shall be disposed at a landfill or incinerator.

SECTION 01670

RECYCLED / RECOVERED MATERIALS

12/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 247	Comprehensive Procurement Guideline for Products Containing Recovered Materials

1.2 OBJECTIVES

Government procurement policy is to acquire, in a cost effective manner, items containing the highest percentage of recycled and recovered materials practicable consistent with maintaining a satisfactory level of competition without adversely affecting performance requirements or exposing suppliers' employees to undue hazards from the recovered materials. The Environmental Protection Agency (EPA) has designated certain items which must contain a specified percent range of recovered or recycled materials. The Contractor shall make all reasonable efforts to use recycled and recovered materials in providing the EPA designated products and in otherwise utilizing recycled and recovered materials in the execution of the work.

1.3 EPA DESIGNATED ITEMS INCORPORATED IN THE WORK

Various sections of the UFGS Guide Specifications contain requirements for materials that have been designated by EPA as being products which are or can be made with recovered or recycled materials. These items, when incorporated into the work under this contract, shall contain at least the specified percentage of recycled or recovered materials unless adequate justification (non-availability) for non-use is provided. When a designated item is specified as an option to a non-designated item, the designated item requirements apply only if the designated item is used in the work.

1.4 EPA PROPOSED ITEMS INCORPORATED IN THE WORK

Products other than those designated by EPA are still being researched and are being considered for future Comprehensive Procurement Guideline (CPG) designation. It is recommended that these items, when incorporated in the work under this contract, contain the highest practicable percentage of recycled or recovered materials, provided specified requirements are also met.

1.5 EPA LISTED ITEMS USED IN CONDUCT OF THE WORK BUT NOT INCORPORATED IN THE WORK

There are many products listed in 40 CFR 247 which have been designated or

proposed by EPA to include recycled or recovered materials that may be used by the Contractor in performing the work but will not be incorporated into the work. These products include office products, temporary traffic control products, and pallets. It is recommended that these non-construction products, when used in the conduct of the work, contain the highest practicable percentage of recycled or recovered materials and that these products be recycled when no longer needed.

SECTION 01780A

CLOSEOUT SUBMITTALS
05/02

PART 1 GENERAL

1.1 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

As-Built Drawings; G

Drawings showing final as-built conditions of the project. The final CADD as-built drawings shall consist of one set of electronic CADD drawing files in the specified format, two sets of black-line prints, and one set of the approved working as-built drawings.

SD-03 Product Data

As-Built Record of Equipment and Materials; G

Two copies of the record listing the as-built materials and equipment incorporated into the construction of the project.

Warranty Management Plan; G

Two sets of the warranty management plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The Contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.

Warranty Tags

Two record copies of the warranty tags showing the layout and design.

Final Cleaning

Two copies of the listing of completed final clean-up items.

1.2 PROJECT RECORD DOCUMENTS

1.2.1 As-Built Drawings

This paragraph covers as-built drawings complete, as a requirement of the contract. The terms "drawings," "contract drawings," "drawing files,"

"working as-built drawings" and "final as-built drawings" refer to contract drawings which are revised to be used for final as-built drawings.

1.2.1.1 Government Furnished Materials

Two sets of paper drawings revised to reflect all bid amendments will be provided by the Government at the preconstruction conference for markup of as-built conditions. Electronic CADD files in Microstation format will be provided by the Government at the preconstruction conference for updating CADD file as-built drawings.

1.2.1.2 Working As-Built and Final As-Built Drawings

The Contractor shall revise two sets of paper drawings by red-line process to show the as-built conditions during the prosecution of the project. These working as-built marked drawings shall be kept current on a weekly basis and at least one set shall be available on the jobsite at all times. Changes from the contract plans which are made in the work or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes. Final as-built drawings shall be prepared after the completion of each definable feature of work as listed in the Contractor Quality Control Plan (Foundations, Utilities, Structural Steel, etc., as appropriate for the project). The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the Contracting Officer and the Contractor prior to submission of each monthly pay estimate. If the Contractor fails to maintain the working and final as-built drawings as specified herein, the Contracting Officer will deduct from the monthly progress payment an amount representing the estimated cost of maintaining the as-built drawings. This monthly deduction will continue until an agreement can be reached between the Contracting Officer and the Contractor regarding the accuracy and completeness of updated drawings. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, the as-built drawings shall show, by offset dimensions to two permanently fixed surface features, the end of each run including each change in direction. Valves, splice boxes and similar appurtenances shall be located by dimensioning along the utility run from a reference point. The average depth below the surface of each run shall also be recorded.

b. The location and dimensions of any changes within the building structure.

c. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

d. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.

e. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.

f. Changes or modifications which result from the final inspection.

g. Where contract drawings or specifications present options, only the option selected for construction shall be shown on the final as-built prints.

h. If borrow material for this project is from sources on Government property, or if Government property is used as a spoil area, the Contractor shall furnish a contour map of the final borrow pit/spoil area elevations. *7

i. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.

j. Modifications (change order price shall include the Contractor's cost to change working and final as-built drawings to reflect modifications) and compliance with the following procedures.

(1) Directions in the modification for posting descriptive changes shall be followed.

(2) A Modification Circle shall be placed at the location of each deletion.

(3) For new details or sections which are added to a drawing, a Modification Circle shall be placed by the detail or section title.

(4) For minor changes, a Modification Circle shall be placed by the area changed on the drawing (each location).

(5) For major changes to a drawing, a Modification Circle shall be placed by the title of the affected plan, section, or detail at each location.

(6) For changes to schedules or drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

(7) The Modification Circle size shall be 12.7 mm 1/2 inch diameter unless the area where the circle is to be placed is crowded. Smaller size circle shall be used for crowded areas.

1.2.1.3 Drawing Preparation

The as-built drawings shall be modified as may be necessary to correctly show the features of the project as it has been constructed by bringing the contract set into agreement with approved working as-built prints, and adding such additional drawings as may be necessary. These working as-built marked prints shall be neat, legible and accurate. These drawings are part of the permanent records of this project and shall be returned to the Contracting Officer after approval by the Government. Any drawings damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at no expense to the Government.

1.2.1.4 Computer Aided Design and Drafting (CADD) Drawings

Only personnel proficient in the preparation of CADD drawings shall be employed to modify the contract drawings or prepare additional new drawings. Additions and corrections to the contract drawings shall be equal in quality and detail to that of the originals. Line colors, line weights, lettering, layering conventions, and symbols shall be the same as the original line colors, line weights, lettering, layering conventions, and symbols. If additional drawings are required, they shall be prepared using the specified electronic file format applying the same graphic standards specified for original drawings. The title block and drawing border to be used for any new final as-built drawings shall be identical to that used on the contract drawings. Additions and corrections to the contract drawings shall be accomplished using CADD files. The Contractor will be furnished "as-designed" drawings in Microstation J format compatible with a Windows NT 2000 operating system or Windows XP. The electronic files will be supplied on compact disc, read-only memory (CD-ROM). The Contractor shall be responsible for providing all program files and hardware necessary to prepare final as-built drawings. The Contracting Officer will review final as-built drawings for accuracy and the Contractor shall make required corrections, changes, additions, and deletions.

a. Corrections shall be made in the "Model" files rather than the individual sheet file when model files are referenced. Once the model file is corrected the individual sheet file will automatically be corrected.

b. The contractor shall modify the drawings at construction completion to indicate the as-built character of all site components:

(1) These drawings will conform to the level symbology of the model files and be free of any superfluous construction detail. The intent is to show As-Built conditions and should not include any components that are not as-built, i.e., if the pre-work map showed a water line 3' from a curb and was constructed 4' from the curb, the as-built map will show only the final location of the water line.

(2) The grading model file will clearly indicate the final grade of the site at a contour interval not greater than one foot.

(3) The final inverts of all utilities will be shown on the model files. Where utilities were installed which follow the surface of the ground, the depth of that utility will be indicated. Where there is a variance in the depth of the utility, the break point and character of variance will be shown.

(4) The model files will clearly identify all utilities installed with a trace wire and/or cathodic protection.

(5) The model files will show a minimum of two tie points for all subsurface control devices to include valves, manholes, handholes, switches, etc. The tie-points will be directed such that they form a triangle with no inclusive angle less than 30° or greater than 150°. No leg of the triangle will be longer than 100' Valid tie-points will run to identifiable above ground objects such as poles or building corners as is in keeping of good survey practice for the recovery of monuments.

(6) The model files will clearly indicate the entry point and

character of all utilities running to or from structures.

c. When final revisions have been completed, the cover sheet drawing shall show the wording "RECORD DRAWING AS-BUILT" followed by the name of the Contractor in letters at least 5 mm 3/16 inch high. All other contract drawings shall be marked either "AS-Built" drawing denoting no revisions on the sheet or "Revised As-Built" denoting one or more revisions. Original contract drawings shall be dated in the revision block.

d. Within 10 days for contracts less than $5 million or 20 days for contracts $5 million and above after Government approval of all of the working as-built drawings for a phase of work, the Contractor shall prepare the final CADD as-built drawings for that phase of work and submit two sets of blue-lined prints of these drawings for Government review and approval. The Government will promptly return one set of prints annotated with any necessary corrections. Within 7 days for contracts less than $5 million or 10 days for contracts $5 million and above the Contractor shall revise the CADD files accordingly at no additional cost and submit one set of final prints for the completed phase of work to the Government. Within 10 days for contracts less than $5 million or 20 days for contracts $5 million and above of substantial completion of all phases of work, the Contractor shall submit the final as-built drawing package for the entire project. The submittal shall consist of one set of electronic files on compact disc, read-only memory (CD-ROM), two sets of blue-line prints and one set of the approved working as-built drawings. They shall be complete in all details and identical in form and function to the contract drawing files supplied by the Government. Any transactions or adjustments necessary to accomplish this is the responsibility of the Contractor. The Government reserves the right to reject any drawing files it deems incompatible with the customer's CADD system. Paper prints, drawing files and storage media submitted will become the property of the Government upon final approval. Failure to submit final as-built drawing files and marked prints as specified shall be cause for withholding any payment due the Contractor under this contract. Approval and acceptance of final as-built drawings shall be accomplished before final payment is made to the Contractor.

1.2.1.5 Omitted

1.2.1.6 Payment

No separate payment will be made for as-built drawings required under this contract, and all costs accrued in connection with such drawings shall be considered a subsidiary obligation of the Contractor.

1.2.2 As-Built Record of Equipment and Materials

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NOTE: This paragraph is intended to provide data on equipment and materials incorporated in the construction of the project that cannot readily be determined after completion of construction. The data is expected to be of value for future maintenance, alteration, and repair work. The designer should predetermine the items on which data is required and list them in the DESCRIPTION column of the following form. A typical list of items would include such things as: roofing, insulation, and special wall coverings.

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The Contractor shall furnish one copy of preliminary record of equipment and materials used on the project 15 days prior to final inspection. This preliminary submittal will be reviewed and returned 2 days after final inspection with Government comments. Two sets of final record of equipment and materials shall be submitted 10 days after final inspection. The designations shall be keyed to the related area depicted on the contract drawings. The record shall list the following data:

RECORD OF DESIGNATED EQUIPMENT AND MATERIALS DATA

Description	Specification Section	Manufacturer and Catalog, Model, and Serial Number	Composition and Size	Where Used

1.2.3 Final Approved Shop Drawings

The Contractor shall furnish final approved project shop drawings 30 days after transfer of the completed facility.

1.2.4 Construction Contract Specifications

The Contractor shall furnish final as-built construction contract specifications, including modifications thereto, 30 days after transfer of the completed facility.

1.2.5 Real Property Equipment
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The Contractor shall furnish a list of installed equipment furnished under this contract. The list shall include all information usually listed on manufacturer's name plate. The "EQUIPMENT-IN-PLACE LIST" shall include, as applicable, the following for each piece of equipment installed: description of item, location (by room number), model number, serial number, capacity, name and address of manufacturer, name and address of equipment supplier, condition, spare parts list, manufacturer's catalog, and warranty. A draft list shall be furnished at time of transfer. The final list shall be furnished 30 days after transfer of each~~the~~ completed facility.

1.3 WARRANTY MANAGEMENT

1.3.1 Warranty Management Plan

The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction in Section 00800. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled. The plan shall be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below shall include due date and whether item has been submitted or was accomplished. Warranty information

made available during the construction phase shall be submitted to the Contracting Officer for approval prior to each monthly pay estimate. Approved information shall be assembled in a binder and shall be turned over to the Government upon acceptance of the work. The construction warranty period shall begin on the date of project acceptance and shall continue for the full product warranty period. A joint 4 month and 9 month warranty inspection shall be conducted, measured from time of acceptance, by the Contractor, Contracting Officer and the Customer Representative. Information contained in the warranty management plan shall include, but shall not be limited to, the following:

a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.

b. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include roofs, HVAC balancing, pumps, motors, transformers, and for all commissioned systems such as fire protection and alarm systems, sprinkler systems, lightning protection systems, etc.

c. A list for each warranted equipment, item, feature of construction or system indicating:

(1) Name of item.
(2) Model and serial numbers.
(3) Location where installed.
(4) Name and phone numbers of manufacturers or suppliers.
(5) Names, addresses and telephone numbers of sources of spare parts.
(6) Warranties and terms of warranty. This shall include one-year overall warranty of construction. Items which have extended warranties shall be indicated with separate warranty expiration dates.
(7) Cross-reference to warranty certificates as applicable.
(8) Starting point and duration of warranty period.
(9) Summary of maintenance procedures required to continue the warranty in force.
(10) Cross-reference to specific pertinent Operation and Maintenance manuals.
(11) Organization, names and phone numbers of persons to call for warranty service.
(12) Typical response time and repair time expected for various warranted equipment.

d. The Contractor's plans for attendance at the 4 and 9 month post-construction warranty inspections conducted by the Government.

e. Procedure and status of tagging of all equipment covered by extended warranties.

f. Copies of instructions to be posted near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

1.3.2 Performance Bond

The Contractor's performance bond shall remain effective throughout the

construction period.

a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the Contracting Officer will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the Government while performing the work, including, but not limited to administrative expenses.

b. In the event sufficient funds are not available to cover the construction warranty work performed by the Government at the Contractor's expense, the Contracting Officer will have the right to recoup expenses from the bonding company.

c. Following oral or written notification of required construction warranty repair work, the Contractor shall respond in a timely manner. Written verification will follow oral instructions. Failure of the Contractor to respond will be cause for the Contracting Officer to proceed against the Contractor.

1.3.3 Pre-Warranty Conference

Prior to contract completion, and at a time designated by the Contracting Officer, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of this section. Communication procedures for Contractor notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by the Contracting Officer for the execution of the construction warranty shall be established/reviewed at this meeting. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor shall furnish the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue construction warranty work action on behalf of the Contractor. This point of contact will be located within the local service area of the warranted construction, shall be continuously available, and shall be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of its responsibilities in connection with other portions of this provision.

1.3.4 Contractor's Response to Construction Warranty Service Requirements

Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the timeframes specified, the Government will perform the work and backcharge the construction warranty payment item established.

a. First Priority Code 1. Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.

b. Second Priority Code 2. Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.

c. Third Priority Code 3. All other work to be initiated within 3 work days and work continuously to completion or relief.

d. The "Construction Warranty Service Priority List" is as follows:

Code 1-Air Conditioning Systems
(1) Recreational support.
(2) Air conditioning leak in part of building, if causing damage.
(3) Air conditioning system not cooling properly.

Code 1-Doors
(1) Overhead doors not operational, causing a security, fire, or safety problem.
(2) Interior, exterior personnel doors or hardware, not functioning properly, causing a security, fire, or safety problem.

Code 3-Doors
(1) Overhead doors not operational.
(2) Interior/exterior personnel doors or hardware not functioning properly.

Code 1-Electrical
(1) Power failure (entire area or any building operational after 1600 hours).
(2) Security lights
(3) Smoke detectors

Code 2-Electrical
(1) Power failure (no power to a room or part of building).
(2) Receptacle and lights (in a room or part of building).

Code 3-Electrical
Street lights.

Code 1-Gas
(1) Leaks and breaks.
(2) No gas to family housing unit or cantonment area.

Code 1-Heat
(1). Area power failure affecting heat.
(2). Heater in unit not working.

Code 2-Kitchen Equipment
(1) Dishwasher not operating properly.
(2) All other equipment hampering preparation of a meal.

Code l-Plumbing
(1) Hot water heater failure.
(2) Leaking water supply pipes.

Code 2-Plumbing
(1) Flush valves not operating properly.

(2) Fixture drain, supply line to commode, or any water pipe leaking.
(3) Commode leaking at base.

Code 3 -Plumbing
Leaky faucets.

Code 3-Interior
(1) Floors damaged.
(2) Paint chipping or peeling.
(3) Casework.

Code 1-Roof Leaks
Temporary repairs will be made where major damage to property is occurring.

Code 2-Roof Leaks
Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.

Code 2-Water (Exterior)
No water to facility.

Code 2-Water (Hot)
No hot water in portion of building listed.

Code 3-All other work not listed above.

1.3.5 Warranty Tags

At the time of installation, each warranted item shall be tagged with a durable, oil and water resistant tag approved by the Contracting Officer. Each tag shall be attached with a copper wire and shall be sprayed with a silicone waterproof coating. The date of acceptance and the QC signature shall remain blank until project is accepted for beneficial occupancy. The tag shall show the following information.

a. Type of product/material_____.

b. Model number_____.

c. Serial number_____.

d. Contract number_____.

e. Warranty period_____ from_____ to_____.

f. Inspector's signature_____.

g. Construction Contractor_____.

Address_____.

Telephone number_____.

h. Warranty contact_____.

Address_____.

Telephone number_____.

i. Warranty response time priority code_____.

j. WARNING - PROJECT PERSONNEL TO PERFORM ONLY OPERATIONAL MAINTENANCE DURING THE WARRANTY PERIOD.

1.4 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and completed checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical specification sections.

1.5 OPERATION AND MAINTENANCE MANUALS

Operation manuals and maintenance manuals shall be submitted as specified. Operation manuals and maintenance manuals provided in a common volume shall be clearly differentiated and shall be separately indexed.

1.6 FINAL CLEANING

The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced. Debris shall be removed from roofs, drainage systems, gutters, downspouts and boot wash areas. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, fences and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

SECTION 01781N

OPERATION AND MAINTENANCE DATA
03/98

PART 1 GENERAL

1.1 SUBMISSION OF OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance (O&M) Data/Manuals which are specifically applicable to this contract and a complete and concise depiction of the provided equipment or product. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal. Submit in accordance with this section and Section 01330, "Submittal Procedures."

1.1.1 Quantity

Submit five sets of the supplier/manufacturers' O&M information specified herein for the components, assemblies, subassemblies, attachments, and accessories. The items for which O&M Data/Manuals are required are listed in the technical sections which specifies those particular items.

1.1.2 Package Quality

Documents must be fully legible. Poor quality copies and material with hole punches obliterating the text or drawings will not be accepted.

1.1.3 Package Content

Data package content shall be as shown in the paragraph titled "Schedule of Operation and Maintenance Data Packages." For each product, system, or component piece of equipment requiring submission of O&M Data, submit the Data Package specified in the individual technical section.

1.1.4 Delivery

Submit O&M Data Manuals to the Contracting Officer for review and acceptance; submit data specified for a given item within 30 calendar days after the item is delivered to the contract site.

a. In the event the Contractor fails to deliver O&M Data/Manuals within the time limits set forth above, the Contracting Officer may withhold from progress payments 50 percent of the price of the item with which such O&M Data/Manuals are associated.

1.1.5 Changes to Submittals

Manufacturer-originated changes or revisions to submitted data shall be furnished by the Contractor if a component of an item is so affected subsequent to acceptance of the O&M Data. Changes, additions, or revisions required by the Contracting Officer for final acceptance of submitted data, shall be submitted by the Contractor within 30 calendar days of the notification of this change requirement.

1.2 TYPES OF INFORMATION REQUIRED IN O&M DATA PACKAGES

1.2.1 Operating Instructions

Include specific instructions, procedures, and illustrations for the following phases of operation:

1.2.1.1 Safety Precautions

List personnel hazards and equipment or product safety precautions for all operating conditions.

1.2.1.2 Operator Prestart

Include procedures required to set up and prepare each system for use.

1.2.1.3 Startup, Shutdown, and Postshutdown Procedures

Provide narrative description for each operating procedure including control sequence for each.

1.2.1.4 Normal Operations

Provide narrative description of normal operating procedures. Include control diagrams with data to explain operation and control of systems and specific equipment.

1.2.1.5 Emergency Operations

Include emergency procedures for equipment malfunctions to permit a short period of continued operation or to shut down the equipment to prevent further damage to systems and equipment. Include emergency shutdown instructions for fire, explosion, spills, or other foreseeable contingencies. Provide guidance on emergency operations of all utility systems including valve locations and portions of systems controlled.

1.2.1.6 Operator Service Requirements

Include instructions for services to be performed by the operator such as lubrication, adjustment, inspection, and gage reading recording.

1.2.1.7 Environmental Conditions

Include a list of environmental conditions (temperature, humidity, and other relevant data) which are best suited for each product or piece of equipment and describe conditions under which equipment should not be allowed to run.

1.2.2 Preventive Maintenance

Include the following information for preventive and scheduled maintenance to minimize corrective maintenance and repair.

1.2.2.1 Lubrication Data

Include lubrication data, other than instructions for lubrication in accordance with paragraph titled "Operator Service Requirements":

a. A table showing recommended lubricants for specific temperature ranges and applications;

b. Charts with a schematic diagram of the equipment showing lubrication points, recommended types and grades of lubricants, and capacities; and

c. A lubrication schedule showing service interval frequency.

1.2.2.2 Preventive Maintenance Plan and Schedule

Include manufacturer's schedule for routine preventive maintenance, inspections, tests and adjustments required to ensure proper and economical operation and to minimize corrective maintenance and repair. Provide manufacturer's projection of preventive maintenance work-hours on a daily, weekly, monthly, and annual basis including craft requirements by type of craft. For periodic calibrations, provide manufacturer's specified frequency and procedures for each separate operation.

1.2.3 Corrective Maintenance (Repair)

Include manufacturer's recommendations on procedures and instructions for correcting problems and making repairs.

1.2.3.1 Troubleshooting Guides and Diagnostic Techniques

Include step-by-step procedures to promptly isolate the cause of typical malfunctions. Describe clearly why the checkout is performed and what conditions are to be sought. Identify tests or inspections and test equipment required to determine whether parts and equipment may be reused or require replacement.

1.2.3.2 Wiring Diagrams and Control Diagrams

Wiring diagrams and control diagrams shall be point-to-point drawings of wiring and control circuits including factory-field interfaces. Provide a complete and accurate depiction of the actual job specific wiring and control work. On diagrams, number electrical and electronic wiring and pneumatic control tubing and the terminals for each type, identically to actual installation numbering.

1.2.3.3 Maintenance and Repair Procedures

Include instructions and list tools required to restore product or equipment to proper condition or operating standards.

1.2.3.4 Removal and Replacement Instructions

Include step-by-step procedures and list required tools and supplies for removal, replacement, disassembly, and assembly of components, assemblies, subassemblies, accessories, and attachments. Provide tolerances, dimensions, settings and adjustments required. Instructions shall include a combination of text and illustrations.

1.2.3.5 Spare Parts and Supply Lists

Include lists of spare parts and supplies required for maintenance and repair to ensure continued service or operation without unreasonable delays. Special consideration is required for facilities at remote locations. List spare parts and supplies that have a long lead time to obtain.

1.2.3.6 Corrective Maintenance Work-Hours

Include manufacturer's projection of corrective maintenance work-hours including craft requirements by type of craft. Corrective maintenance that requires participation of the equipment manufacturer shall be identified and tabulated separately.

1.2.4 Appendices

Provide information required below and information not specified in the preceding paragraphs but pertinent to the maintenance or operation of the product or equipment. Include the following:

1.2.4.1 Parts Identification

Provide identification and coverage for all parts of each component, assembly, subassembly, and accessory of the end items subject to replacement. Include special hardware requirements, such as requirement to use high-strength bolts and nuts. Identify parts by make, model, serial number, and source of supply to allow reordering without further identification. Provide clear and legible illustrations, drawings, and exploded views to enable easy identification of the items. When illustrations omit the part numbers and description, both the illustrations and separate listing shall show the index, reference, or key number which will cross-reference the illustrated part to the listed part. Parts shown in the listings shall be grouped by components, assemblies, and subassemblies. Parts data may cover more than one model or series of equipment, components, assemblies, subassemblies, attachments, or accessories, such as a master parts catalog, in accordance with the manufacturer's standard commercial practice.

1.2.4.2 Warranty Information

List and explain the various warranties and include the servicing and technical precautions prescribed by the manufacturers or contract documents to keep warranties in force. Include warranty information for primary components such as the compressor of air conditioning system. See SECTION 01780A for additional provisions concerning warranties.

1.2.4.3 Personnel Training Requirements

Provide information available from the manufacturers to use in training designated personnel to operate and maintain the equipment and systems properly.

1.2.4.4 Testing Equipment and Special Tool Information

Include information on test equipment required to perform specified tests and on special tools needed for the operation, maintenance, and repair of components.

1.2.4.5 Contractor Information

Provide a list that includes the name, address, and telephone number of the General Contractor and each subcontractor installing the product or equipment. Include local representatives and service organizations most convenient to the project site. Provide the name, address, and telephone number of the product or equipment manufacturers.

1.3 SCHEDULE OF OPERATION AND MAINTENANCE DATA PACKAGES

Furnish the O&M Data Packages specified in individual technical sections. The required information for each O&M Data Package is as follows:

1.3.1 Data Package 1

a. Safety precautions

b. Maintenance and repair procedures

c. Warranty information

d. Contractor information

1.3.2 Data Package 2

a. Safety precautions

b. Normal operations

c. Environmental conditions

d. Lubrication data

e. Preventive maintenance plan and schedule

f. Maintenance and repair procedures

g. Removal and replacement instructions

h. Spare parts and supply list

i. Parts identification

j. Warranty information

k. Contractor information

1.3.3 Data Package 3

a. Safety precautions

b. Normal operations

c. Emergency operations

d. Environmental conditions

e. Lubrication data

f. Preventive maintenance plan and schedule

g. Troubleshooting guides and diagnostic techniques

h. Wiring diagrams and control diagrams

i. Maintenance and repair procedures

j. Removal and replacement instructions

k. Spare parts and supply list

l. Parts identification

m. Warranty information

n. Testing equipment and special tool information

o. Contractor information

1.3.4 Data Package 4

a. Safety precautions

b. Operator prestart

c. Startup, shutdown, and postshutdown procedures

d. Normal operations

e. Emergency operations

f. Operator service requirements

g. Environmental conditions

h. Lubrication data

i. Preventive maintenance plan and schedule

j. Troubleshooting guides and diagnostic techniques

k. Wiring diagrams and control diagrams

l. Maintenance and repair procedures

m. Removal and replacement instructions

n. Spare parts and supply list

o. Corrective maintenance man-hours

p. Parts identification

q. Warranty information

r. Personnel training requirements

s. Testing equipment and special tool information

t. Contractor information

1.3.5 Data Package 5

a. Safety precautions

b. Operator prestart

c. Start-up, shutdown, and post shutdown procedures

d. Normal operations

e. Environmental conditions

f. Preventive maintenance plan and schedule

g. Troubleshooting guides and diagnostic techniques

h. Wiring and control diagrams

i. Maintenance and repair procedures

j. Spare parts and supply list

k. Testing equipments and special tools

l. Warranty information

m. Contractor information

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

SECTION 02091

HAZARDOUS BUILDING MATERIALS REMOVAL AND RECYLING

PART 1 - GENERAL

PCB light fixture ballasts, fluorescent light troffers with 3 and 4 lamp fluorescents, and high intensity direct (HID) fixtures (classed as 'Hazardous Waste Lamps' {HWL}) and possibly mercury containing switches and voltage regulators, fluorocarbon-containing window units, are present in buildings scheduled for demolition. Electrical fixtures are found in the interior and the exterior of the buildings. These fixtures are to be removed prior to demolition after all asbestos containing materials have been removed. Fixtures are regulated based upon the presence of PCB containing electrical equipment. HWLs are regulated due to the mercury contained in the lamps. Mercury thermostats and other mercury containing materials are also to be removed. Only ballasts labeled as non-PCB containing shall be disposed of in a landfill with the general demolition debris. Should any other mercury or PCB containing materials be discovered during demolition, the Contractor shall immediately notify the Contracting Officer. No hazardous materials may be disposed of in a landfill or re-used for rubble or other environmentally sensitive use. Incidental lead-based paint coated building components may be disposed with the general debris in a North Carolina landfill. For approximate quantities of hazardous building materials present in each building see Appendix E of the RFP.

The Federal Environmental Protection Agency (EPA) considers unbroken mercury containing lamps as universal waste. Unbroken lamps shall be packed and shipped with applicable Department of Transportation Labeling but do not need a full hazardous materials manifesting. They do require a Universal Waste 'Bill of Lading" and a state 'Universal Waste' haulers identification number. Broken HWL are considered 'Hazardous Waste' and RCRA and DOT requirements apply unless they are cleaned-up and recycled.

Transformers, capacitors, electrical light ballasts, electromagnets, switches, and voltage regulators are considered PCB Articles, subclassed as PCB Equipment. All capacitors are assumed to contain PCBs unless a label or chemical analysis states that they do not. PCB ballasts must be disposed of as hazardous wastes or taken to a recycler and may not be re-sold to subsequent users.

1.1 Work Requirements:

The Contractor shall provide all personnel, transportation, services, materials, equipment, technical and management support required to perform the requirements as defined i¥Á□[□□□ð□¿□□□□□□□□□□□□□□□ß8□□

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□'universal waste'.

2. DEFINITIONS

2.1 Certified Recycling Facility (CRF): A facility that can validate that recyclable materials received are manufactured into new materials for commercial sale or are reused onsite by the facility.

2.2 Hazardous Materials Transporter: A person engaged in the off-site transportation of waste mercury-containing lamps, or PCB ballasts and transformers by air, rail, highway or water.

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2.3 PCB Ballasts: Light Ballasts weighing less than 50 pounds that may contain polychlorinated biphenols (PCBs).

2.4 Hazardous Waste Lamps (HWL): Any type of high or low pressure lighting device that is unprocessed, contains mercury and generated light through the discharge of electricity either directly or indirectly through a fluorescing coating. Includes fluorescent lamps, mercury lamps, metal halide lamps and high-pressure sodium lamps.

2.5 Waste Mercury-Containing Lamp Transfer Facility: Any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of waste mercury-containing lamps are held during the normal course of transportation for ten days or less.

3. GOVERNMENT FURNISHED ITEMS AND SERVICES: The government shall not provide any materials or services under this specification accept to accompany the Contractor during his walk-through to assess exact numbers of materials to be removed under this specification.

4. CONTRACTOR FURNISHED ITEMS AND SERVICES: The Contractor shall furnish everything required to meet the conditions of this specification.

4.1 Equipment, Materials and Tools: The Contractor shall furnish all labor, equipment, materials, supplies, containers, labels, tools, vehicles and supervision necessary to perform the work defined in this contract.

4.2 Equipment: All equipment which is used by the Contractor to collect, transfer, transport, containerize and otherwise handle waste mercury-containing lamps, PCB ballasts and transformers shall meet all applicable federal and state requirements. Appropriate and permitted vehicles must be used to collect and transport the recyclable hazardous materials to the appropriate transfer and recycling/reclaim facilities.

4.3 Materials: The Contractor shall provide appropriate collection containers for the safe collection and shipment of waste mercury-containing lamps that will accommodate 4 foot and 8 foot tube lengths as well as other sized and shaped lamps, and for the collection and shipment of small PCB ballasts and transformers. Containers for miscellaneous mercury containing materials such as thermostats and switches shall also be provided. Containers provided by the Contractor shall meet the requirements of the receiving certified recycling facility and the Department of Transportation (DOT). The Contractor shall also provide appropriate shipping labels for these containers.

4.3.1 Labeling Collection Containers: Logo decals and descriptive labels (i.e. "Used Mercury-Containing lamps" or PCB Ballasts") shall initially be placed by the contractor on all containers used to collect these materials respectively. Used Mercury-containing lamps shall not be considered hazardous waste while intact.

*7

4.3.2 Transportation: The Contractor shall provide permitted transportation for the collection, transfer, removal and transport of waste mercury-containing lamps, PCB ballasts and transformers from Fort Bragg to appropriate recycling and reclamation facilities. In addition, any hazardous waste encountered shall be removed by the Contractor. As per the Research and Special Programs administration (RSPA) of the Department of Transportation (DOT) each motor carrier registered under 40 CFR 107 must maintain a copy of the current certificate in each motor vehicle used to transport hazmat. Shipping papers shall have the haz~~n~~mat registration number and the names and addresses of both consignor and each consignee~~consinee~~. Addresses must be physical street addresses and not billing addresses. In addition, all Hazmat employees must show proof of having received awareness training in security issues associated with hazmat transportation. RSPA's website has a free module which can be used to assist shippers in meeting this requirement.

4.3.3 Forms and Notifications: It is the responsibility of the Contractor to determine which forms must be completed for compliance with state, federal, and local requirements complete and submit these forms. Copies of all notification forms shall be included in the PCB ARTICLES AND HAZARDOUS WASTE LAMPS DISPOSITION REPORT.

5. SPECIFIC TASKS

5.1 The contractor shall perform mercury-containing fluorescent light, HID light, thermostat, and related mercury devices and PCB ballast/transformer/articles recycling/disposal. These materials are to be re-cycled so as to maintain their universal waste status. (Note large exterior transformers by the former laundry are not PCB contaminated transformers.

5.2 The Contractor, along with the Contracting Officer or his designated representative, shall determine a fixed quantity of said materials to be removed from the prior to commencement of work. Broken HWL shall be noted at this time.

5.3 All waste mercury-containing lamps shall be delivered to a certified recycling facility (CRF), which has been approved prior to use by the Contracting Officer or his representative, where they shall be disassembled, reclaimed and prepared for marketing as a raw material in a manner that constitutes recycling as defined in the Resource Conservation and Recovery Act (RCRA) (40 CFR 266).

5.4 PCB ballasts and transformers shall be delivered to a certified recycling facility (CRF) which has been approved prior to use by the Contracting Officer, where they shall be disassembled. PCB-contaminated liquids shall be incinerated in accordance with 40 CFR 720. All other parts of the ballast shall be reclaimed, reused or prepared for marketing as a raw material in a manner that constitutes recycling as defined in RCRA (40 CFR 266).

5.5 The Contractor must submit 3 copies of manifests, bills of lading and other receipts for every shipment transported off-site from the Fort Bragg 16th Military Police Brigade Barracks Project to a transfer

facility or recycling facility. (One copy goes to Ft Bragg's Master Planning office, Attn. Christine Hull..) All copies must show name, address and phone number of receiving facility, as well as weight in pounds of materials being received. Receipts must be from the Fort Bragg 6th Military Police Brigade Barracks only. The Contractor, in accordance with RCRA regulations and the state and federal standards for mercury-containing lamps, must fulfill all applicable transportation and record keeping requirements. Each copy must have a cover letter with the project name, contract number and Contractor's name included.

5.6 The Contractor shall ensure that all mercury-containing lamps, thermostats, PCB ballasts, and transformers are transported by a permitted hazardous materials transporter directly to a permitted transfer facility or permitted recycling facility, completing proper DOT shipping documentation and obtaining signature of transfer on shipping documentation from the Contracting Officer prior to leaving the site.

5.7 The Contractor shall take all precautions against breakage of mercury-containing lamps. If any mercury-containing lamps are broken during handling by the Contractor, they are considered to be hazardous waste and handled in accordance RCRA regulation. The Contractor shall be responsible for all costs associated with the cleanup and disposal of hazardous waste generated by the Contractor's employees if intact lamps are broken while being collected and transported.

5.7.1 It is the Contractor's responsibility to clean up any pre-existing broken HWL. This material is to be treated, shipped and disposed of as hazardous waste and shall meet all of the requirements (personal protective equipment, hazard posting, site control, emergency responder training, medical clearance to wear a respirator, etc as stated in OSHA's Hazardous Waste Site and Emergency Responder, 29 CFR 1926.65). Prior to removal activities, the Contractor shall walk the buildings with the Contracting Officer to determine the number of broken HWLs. The Contractor shall submit an estimate for the clean up and disposal costs of broken HWL and will be reimbursed by the government. All other breakage caused by the removal and handling of the HWLs shall be the Contractor's responsibility and will not be reimbursable, as it was not generated by the government.

6. REFERENCES, PUBLICATIONS AND FORMS

6.1 The Contractor shall comply with the issue or version (including all changes and amendments) of Federal, State and local environmental statutes and regulations in effect on the day of issuance of this contract, including the applicable portions of the documents cited in the basic contract. References include but are not limited to the following.

Environmental Protection Agency 40 CFR Parts 260, 261, 264, 265, 268, 270 and 273

Environmental Protection Agency, Resource Conservation and Recovery Act (RCRA) (40 CFR 266).

Environmental Protection Agency, Disposal of Polychlorinated Biphenyls (PCBs) Federal Register vol. 63 29 June 1998, p. 25283 together with 40 CFR 761.

Hazardous Waste Management System: Modification of the Hazardous Waste Program; Hazardous Waste Lamps, Final Rule Federal Register Vol. 64 No. 128, July 6 1999 Rules and Regulations

Hazardous Waste and Emergency Responder 29 CFR 1926.65

7. SUBMITTALS

(GA) CERTIFICATION of APPPROVED RECYCLING or TRANSFER FACILITY: To be submitted 30 days prior to the removal of recyclable from the site (reference Section 5.3 and 5.4) and any time the Contractor changes facilities.

(GA) RECEIPT of MATERIALS at TRANSFER or RECYCLING FACILITY OR TSDF: To be submitted no later than 30 days from the date of shipment (reference Sections 5.5 and 5.6).

(GA) SPILL PREVENTION and RESPONSE PLAN: Three (3) separately bound copies including the names of workers responsible for handling of PCB articles and HWLs. Submittal shall include the requirements of 29 CFR 1926.65 Emergency Responders and all applicable training and certifications.

(GA) PCB ARTICLES and HAZARDOUS WASTE LAMPS DISPOSITION REPORT: Three (3) separately bound copies of all logs, invoices, forms, notices, manifests, bills of lading or other shipping documents shall be submitted at the completion of the removal operations specified in this section.

CEGS-10550 (12/97)

SECTION 10550

*6 POSTAL UNITS

PART 1 GENERAL

1.1 OMITTED

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings

Shop drawings shall indicate material thickness, type, grade and class, rough opening dimensions, overall finish dimensions, compartment size, number of compartments and arrangement, construction details, door construction and hardware, locking, method of identification, anchorage and erection details.

SD-03 Product Data

Manufacturer's Data

Manufacturer's descriptive data shall indicate type of mailboxes, collection units, materials, finishes, loading/unloading procedures, types of locks and installation instructions. Text explaining details of information to be submitted.

1.3 GENERAL REQUIREMENTS

Furnish and install rear loading mailboxes and parcel lockers, rear access collection unit, trim and accessories in the quantities indicated. Mailboxes, parcel lockers and collection units shall be USPS approved construction and installation.

1.4 HANDLING AND DELIVERY

Postal units shall be adequately packaged and protected during shipment and shall be inspected for damage or stain upon delivery to the job site. They shall be carefully handled to avoid damage and shall be stored in a dry weathertight, ventilated area until installation.

PART 2 PRODUCTS

2.1 MAILBOX TYPE

Mailboxes shall be rear loading horizontal type. Individual compartment size shall be minimum 5 inches high by 6 inches wide by 15 inches deep.

2.1.1 Removal Rear Cover

Each mailbox module shall have a sheet aluminum removable rear cover strengthened with formed sheet aluminum stiffeners.

2.2 COMPARTMENT CONSTRUCTION

Mail compartments shall be manufacturer's standard compartment made of double-wall high strength sheet aluminum with stiffener frames.

2.3 COMPARTMENT DOORS

Compartment doors shall be manufacturer's standard doors fabricated of extruded aluminum not less than 0.125 inch thick with integral reinforcing ribs. Doors shall swing on concealed hinges.

2.4 COMPARTMENT DOOR LOCKS

Each mail compartment door shall be provided a lock, keyed different from all other locks supplied for the project. The lock shall be a five pin tumbler cam type with two change keys per lock and a minimum of 1,000 available key changes.

2.5 COMPARTMENT DOOR IDENTIFICATION

Each compartment door shall have 1/2 inch letters/numbers identifying unit and occupant permanently engraved in the face of the door. Numbering shall be in sequence vertically from left to right.

2.6 TRIM

Trim shall be manufacturer's standard aluminum trim to match mailboxes. Trim shall have mitered corners.

2.7 FINISH

Finish on mailbox fronts and associated trim shall be satin aluminum, medium bronze anodized.

2.8 COLLECTION UNITS

Unit shall have hopper door with inside deflector, engraved letters, and schedule card insert. Size shall be approximately 18 inches wide, 36 inches high, 12 inches deep. Removal of mail from unit shall be from inside of mailroom.

2.8.1 Finish

Collection unit finish, trim and construction shall be the same as that specified for the mail compartments and shall be USPS approved.

2.9 PARCEL LOCKERS

Parcel lockers shall be rear loading. The configuration of compartments and compartment sizes shall provide a range of sizes. At least one shall be approximately 20 inches high by 12 inches wide.

2.9.1 Finish

Parcel lockers' finish, trim and construction shall be the same as that specified for the mail compartments.

2.9.2 Locking System

Parcel lockers shall have a two-key locking system. One key will open the locker but will then be automatically retained in its lock until removed by the control key.

PART 3 EXECUTION

3.1 INSTALLATION

Postal units and accessories shall be installed in accurately framed openings with units plumb and adequately secured in position. Installation shall comply with current U.S. Postal Service regulations.

-- End of Section --

SAVH-10901 (10/97)

SECTION 10902

*6 TA-50 STORAGE LOCKERS
10/97

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 123	(1989a) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A 446	(1989) Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
ASTM A 525	(1990) Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Storage Lockers

Detail drawings indicating locker layout, materials, member size, thickness, gauge, hardware, fasteners and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instruction.

1.3 GENERAL DESCRIPTION

TA-50 storage lockers shall be single lockers as indicated on the drawings meeting the following minimum specifications. Lockers shall be sized as shown on the drawings. The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123, ASTM 446, or ASTM A 525, as applicable. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Thickness of metal and details of assembly and supports shall provide strength and stiffness.

1.4 WORKMANSHIP

Drilling and punching shall produce clean true lines and surfaces. Exposed surfaces of work in place shall have a smooth finish. Corner joints shall be well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

1.5 ANCHORAGE

Anchorage shall be provided for fastening lockers securely in place. Anchorage to concrete shall be as recommended by the locker manufacturer.

PART 2 PRODUCTS

2.1 LOCKERS

Lockers shall be heavy duty, all welded ventilated type. Locker units shall be welded at all seams and joints with all exposed welds sanded smooth. There shall be no bolts, rivets or screws used in the construction of the main locker unit.

2.1.1 Tops, Bottoms, Shelves, and Filler Panels

All tops, bottoms, shelves, and filler front and top panels shall be constructed of.059 inch minimum thick cold rolled sheet steel.

2.1.2 Sides, Intermediate Partitions and Backs

All sides, intermediate partitions and backs shall be constructed of.089 inch minimum thick flattened expanded metal welded to angle iron frames with all exposed edges bond sheared. Perforated metal with a minimum free area of 50 percent may be substituted for expanded metal.

2.1.3 Frames

Frames shall be constructed of 1 inch by 1 inch by 1/8 inch minimum angle iron steel continuously welded.

2.1.4 Doors

Double doors shall be framed with 1 inch by 1 inch by 1/8 inch minimum angle iron steel and infilled with.089 inch minimum thick flattened expanded metal. A.089 inch minimum thick steel panel with a.059 inch minimum thick cold rolled steel back panel shall be welded to the center span of the door. Doors shall have a three-point three-sided cremone latch and shall be padlockable. Perforated metal with a minimum free area of 50 percent may be substituted for expanded metal.

2.1.5 Hinges

Door shall be hinged with minimum five-knuckle heavy duty steel pin butt hinges welded to both door and locker frame. Provide three hinges for single tier doors.

2.1.6 Number Plate

Provide one aluminum number plate on each locker door with number etched on face of plate. Lockers grouped in each individual room or space shall be numbered in sequential order.

2.1.7 Hooks

Two single wall hooks shall be provided in each locker less than 24 inches wide and three hooks shall be provided in spaces 24 inches wide and over. One double ceiling hook shall be provided in double tier lockers. Hooks shall be forged steel with ball ends and be zinc plated.

2.1.8 Clothes Rod

Provide a galvanized or stainless steel clothes rod in place of ceiling hook in single tier lockers. Rod shall be mounted from side to side of locker space and be attached to side panels.

2.1.9 Base

Closed welded steel base minimum.075 inch thick shall be welded to locker bottom and be enclosed on all four sides. Base shall be approximately 4 inches high.

2.1.10 Finish

Exposed steel parts shall be given a coat of rust inhibitive phosphate treatment and then finished with a heavy coat of high quality baked enamel. Unless otherwise indicated in Section 09000 BUILDING COLOR AND FINISH SCHEDULE, color shall be manufacturer's standard tan or gray.

PART 3 EXECUTION

3.1 INSTALLATION

TA-50 storage lockers shall be installed in place in accordance with the approved manufacturer's installation instructions. Anchorage to concrete base shall be according to the manufacturer's recommendations.

-- End of Section --

SECTION 13280

ASBESTOS ABATEMENT
10/02

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Detail Sheets and Set-Up Details that are referenced in this specification can be obtained from the Internet at http://www.hnd.usace.army.mil. Click on “TECHINFO” and search list for asbestos.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2	(1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems
ANSI Z87.1	(1989; Errata; Z87.1a) Occupational and Educational Eye and Face Protection
ANSI Z88.2	(1992) Respiratory Protection

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 732	(1995) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 522	(1993a) Mandrel Bend Test of Attached Organic Coatings
ASTM D 1331	(1989; R 1995) Surface and Interfacial Tension of Solutions of Surface-Active Agents
ASTM D 2794	(1993) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 4397	(1996) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E 84	(1998e1) Surface Burning Characteristics of Building Materials
ASTM E 96	(1995) Water Vapor Transmission of Materials
ASTM E 119	(1998) Fire Tests of Building Construction and Materials

ASTM E 736	(1992) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E 1368	(1997) Visual Inspection of Asbestos Abatement Projects

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 61	National Emissions Standards for Hazardous Air Pollutants
40 CFR 763	Asbestos
42 CFR 84	Approval of Respiratory Protective Devices
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 171	General Information, Regulations and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packagings

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(1990) Compressed Air for Human Respiration
CGA G-7.1	(1997) Commodity Specification for Air

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996) Safety and Health Requirements Manual

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90-018	(1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
EPA 340/1-90-019	(1990) Asbestos/NESHAP Adequately Wet Guidance
EPA 560/5-85-024	(1985) Guidance for Controlling Asbestos-Containing Materials in Buildings

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701 (1996; TIA 96-1, 96-2) Methods of Fire Tests for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 84-100 (1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

NORTH CAROLINA, STATE OF

Chapter 130A Public Health Article 19 North Carolina Asbestos Rules, Regulations, and Procedures, NC Department of Environment, Health, and Natural Resources Division of Epidemiology Occupational & Environmental Epidemiology Section Health Hazards Control Branch, Raleigh NC, July 1, 1996

UNDERWRITERS LABORATORIES (UL)

UL 586 (1996) High-Efficiency, Particulate, Air Filter Units

1.2 DEFINITIONS

a. Adequately Wet: A term defined in 40 CFR 61, Subpart M, and EPA 340/1-90-019 meaning to sufficiently mix or penetrate with liquid to prevent the release of particulate. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

b. Aggressive Method: Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact asbestos-containing material (ACM).

c. Amended Water: Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.</TAI>

d. Asbestos: Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophylite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

e. Asbestos-Containing Material (ACM): Any materials containing more than one percent asbestos.

f. Asbestos Fiber: A particulate form of asbestos, 5 micrometers or longer, with a length-to-width ratio of at least 3 to 1.

g. Authorized Person: Any person authorized by the Contractor and required by work duties to be present in the regulated areas.

h. Building Inspector: Individual who inspects buildings for asbestos and has EPA Model Accreditation Plan (MAP) "Building Inspector" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

i.(1) Certified Industrial Hygienist (CIH): An Industrial Hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

i.(2) Independent Certified Industrial Hygienist (ICIH): An Industrial Hygienist certified in the practice of industrial hygiene by the American Board of Industrial Hygiene who is retained by the prime Contractor for abatement Subcontractor oversight.
Class I Asbestos Work: Activities defined by OSHA involving the removal of thermal system insulation (TSI) and surfacing ACM.

k. Class II Asbestos Work: Activities defined by OSHA involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos - containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic. Certain "incidental" roofing materials such as mastic, flashing and cements when they are still intact are excluded from Class II asbestos work. Removal of small amounts of these materials which would fit into a glovebag may be classified as a Class III job.

l. Class III Asbestos Work: Activities defined by OSHA that involve repair and maintenance operations, where ACM, including TSI and surfacing ACM, is likely to be disturbed. Operations may include drilling, abrading, cutting a hole, cable pulling, crawling through tunnels or attics and spaces above the ceiling, where asbestos is actively disturbed or asbestos-containing debris is actively disturbed.

m. Class IV Asbestos Work: Maintenance and custodial construction activities during which employees contact but do not disturb ACM and activities to clean-up dust, waste and debris resulting from Class I, II, and III activities. This may include dusting surfaces where ACM waste and debris and accompanying dust exists and cleaning up loose ACM debris from TSI or surfacing ACM following construction.

n. Clean room: An uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

o. Competent Person: In addition to the definition in 29 CFR 1926, Section .32(f), a person who is capable of identifying existing asbestos hazards as defined in 29 CFR 1926, Section .1101, selecting the appropriate control strategy, has the authority to take prompt corrective measures to eliminate them and has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

p. Contractor/Supervisor: Individual who supervises asbestos abatement work and has EPA Model Accreditation Plan

"Contractor/Supervisor" training; accreditation required by 40 CFR 763, Subpart E, Appendix C.

q. Critical Barrier: One or more layers of plastic sealed over all openings into a regulated area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a regulated area from migrating to an adjacent area.

r. Decontamination Area: An enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment that are contaminated with asbestos.</TAI>

s. Demolition: The wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

t. Disposal Bag: A 0.15 mm thick, leak-tight plastic bag, pre-labeled in accordance with 29 CFR 1926, Section .1101, used for transporting asbestos waste from containment to disposal site.

u. Disturbance: Activities that disrupt the matrix of ACM, crumble or pulverize ACM, or generate visible debris from ACM. Disturbance includes cutting away small amounts of ACM, no greater than the amount which can be contained in 1 standard sized glovebag or waste bag, not larger than 1.5 m in length and width in order to access a building component.

v. Equipment Room or Area: An area adjacent to the regulated area used for the decontamination of employees and their equipment.

w. Employee Exposure: That exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

x. Fiber: A fibrous particulate, 5 micrometers or longer, with a length to width ratio of at least 3 to 1.

y. Friable ACM: A term defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 meaning any material which contains more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy (PLM), that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent, as determined by a method other than point counting by PLM, the asbestos content is verified by point counting using PLM.

z. Glovebag: Not more than a 1.5 by 1.5 m impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

aa. High-Efficiency Particulate Air (HEPA) Filter: A filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

bb. Homogeneous Area: An area of surfacing material or thermal system insulation that is uniform in color and texture.

cc. Industrial Hygienist: A professional qualified by education, training, and experience to anticipate, recognize, evaluate, and develop controls for occupational health hazards.

dd. Intact: ACM which has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. Removal of "intact" asphaltic, resinous, cementitious products does not render the ACM non-intact simply by being separated into smaller pieces.

ee. Model Accreditation Plan (MAP): USEPA training accreditation requirements for persons who work with asbestos as specified in 40 CFR 763, Subpart E, Appendix C.

ff. Modification: A changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system.

gg. Negative Exposure Assessment: A demonstration by the Contractor to show that employee exposure during an operation is expected to be consistently below the OSHA Permissible Exposure Limits (PELs).

hh. NESHAP: National Emission Standards for Hazardous Air Pollutants. The USEPA NESHAP regulation for asbestos is at 40 CFR 61, Subpart M.

ii. Nonfriable ACM: A NESHAP term defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 meaning any material containing more than 1 percent asbestos, as determined using the method specified in 40 CFR 763, Subpart E, Appendix A, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

jj. Nonfriable ACM (Category I): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90-018 meaning asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy.

kk. Nonfriable ACM (Category II): A NESHAP term defined in 40 CFR 61, Subpart E and EPA 340/1-90-018 meaning any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos, as determined using the methods specified in 40 CFR 763, Subpart F, Appendix A, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

ll. Permissible Exposure Limits (PELs):

(1) PEL-Time weighted average (TWA): Concentration of asbestos not in excess of 0.1 fibers per cubic centimeter of air (f/cc) as an 8 hour time weighted average (TWA), as determined by the method

prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH Pub No. 84-100 analytical method 7400.

(2) PEL-Excursion Limit: An airborne concentration of asbestos not in excess of 1.0 f/cc of air as averaged over a sampling period of 30 minutes as determined by the method prescribed in 29 CFR 1926, Section .1101, Appendix A, or the current version of NIOSH Pub No. 84-100 analytical method 7400.

mm. Regulated Area: An OSHA term defined in 29 CFR 1926, Section .1101 meaning an area established by the Contractor to demarcate areas where Class I, II, and III asbestos work is conducted; also any adjoining area where debris and waste from such asbestos work accumulate; and an area within which airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed, the permissible exposure limit.

nn. Removal: All operations where ACM is taken out or stripped from structures or substrates, and includes demolition operations.

oo. Repair: Overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM attached to structures or substrates. If the amount of asbestos so "disturbed" cannot be contained in 1 standard glovebag or waste bag, Class I precautions are required.

p. Spills/Emergency Cleanups: Cleanup of sizable amounts of asbestos waste and debris which has occurred, for example, when water damage occurs in a building, and sizable amounts of ACM are dislodged. A Competent Person evaluates the site and ACM to be handled, and based on the type, condition and extent of the dislodged material, classifies the cleanup as Class I, II, or III. Only if the material was intact and the cleanup involves mere contact of ACM, rather than disturbance, could there be a Class IV classification.

qq. Surfacing ACM: Asbestos-containing material which contains more than 1% asbestos and is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

rr. Thermal system insulation (TSI) ACM: ACM which contains more than 1% asbestos and is applied to pipes, fittings, boilers, breeching, tanks, ducts, or other interior structural components to prevent heat loss or gain or water condensation.

ss. Transite: A generic name for asbestos cement wallboard and pipe.

tt. Worker: Individual (not designated as the Competent Person or a supervisor) who performs asbestos work and has completed asbestos worker training required by 29 CFR 1926, Section .1101, to include EPA Model Accreditation Plan (MAP) "Worker" training; accreditation required by 40 CFR 763, Subpart E, Appendix C, if required by the OSHA Class of work to be performed or by the state where the work is to be performed.

1.3 DESCRIPTION OF WORK

The work covered by this section includes the removal CLASS I II III ABATEMENT of asbestos-containing materials (ACM) which are encountered prior to demolition activities associated with this project and describes procedures and equipment required to protect workers and occupants of the regulated area from contact with airborne asbestos fibers and ACM dust and debris. Activities include OSHA CLASS II REMOVAL work operations involving ACM. The work also includes containment, storage, transportation and disposal of the generated ACM wastes. More specific operational procedures shall be detailed in the required Accident Prevention Plan and its subcomponents, the Asbestos Hazard Abatement Plan and Activity Hazard Analyses required in paragraph SAFETY AND HEALTH PROGRAM AND PLANS.
*7
Where possible non-friable materials are to be demolished with the building. Removal of nonfriable roofing materials and floor tile mastic is not to be done unless there is a regulatory requirement or health and safety issue. The Contractor’s Designer shall complete Table 1 of this section, describing how ACM shall be handled. The Contractor’s Designer shall access Appendix E of the RFP for details on the location and approximate quantities of ACM materials. The installation has requested that all non-friable ACM be removed from the building if the building debris is to be disposed of in the Lamont Landfill.

Although not identified in the Asbestos Survey Reports, there is a possibility of encountering Asbestos Transite Piping used for water/sewer lines. The Contractor’s Designer shall also address how this material shall be handled if encountered.

1.3.1 Abatement Work Tasks

The specific ACM to be abated is identified on the detailed plans and project drawings. A summary of work task data elements for each individual ACM abatement work task to include the appropriate RESPONSE ACTION DETAIL SHEET (item to be abated and methods to be used) and SET-UP DETAIL SHEETS (containment techniques to include safety precautions and methods) is included in Table 1, "Individual Work Task Data Elements" at the end of this section.

1.3.2 Unexpected Discovery of Asbestos

For any previously untested building components suspected to contain asbestos and located in areas impacted by the work, the Contractor shall notify the Contracting Officer (CO) who will have the option of ordering up to 4 bulk samples to be obtained at the Contractor's expense and delivered to a laboratory accredited under the National Institute of Standards and Technology (NIST) "National Voluntary Laboratory Accreditation Program (NVLAP)" and analyzed by PLM at no additional cost to the Government. Any additional components identified as ACM that have been approved by the Contracting Officer for removal shall be removed by the Contractor and will be paid for by an equitable adjustment to the contract price under the CONTRACT CLAUSE titled "changes". Sampling activities undertaken to determine the presence of additional ACM shall be conducted by personnel who have successfully completed the EPA Model Accreditation Plan (MAP) "Building Inspector" training course required by 40 CFR 763, Subpart E, Appendix C.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD- Asbestos Abatement and Control Plan; GA.

These shall be plans detailing how the hazard of asbestos fibers shall be controlled. The following submittal items shall be gathered together and submitted in the plans. The use of cut sheets is acceptable, however sheets with multiple products must have the designated materials marked in pen (not highlighter). The Asbestos Abatement and Control Plan shall be reviewed and accepted by the Savannah District Office of Occupational Health and Safety.

SD-03 Product Data

Respiratory Protection Program; G,

Records of the respirator program.

Cleanup and Disposal; G,

Waste shipment records. Weigh bills and delivery tickets shall be furnished for information only.

Detailed Drawings; G,

Descriptions, detail project drawings, and site layout to include worksite containment area techniques as prescribed on applicable SET-UP DETAIL SHEETS, local exhaust ventilation system locations, decontamination units and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.

Materials and Equipment; [__G___],

Manufacturers' catalog data for all materials and equipment to be used in the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of this specification. Material Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM. Data shall include, but shall not be limited to, the following items:

a. High Efficiency Filtered Air (HEPA) local exhaust equipment

b. Vacuum cleaning equipment

c. Pressure differential monitor for HEPA local exhaust equipment

d. Air monitoring equipment

e. Respirators

f. Personal protective clothing and equipment

(1) Coveralls
(2) Underclothing
(3) Other work clothing
(4) Foot coverings
(5) Hard hats
(6) Eye protection
(7) Other items required and approved by Contractors Designated IH and Competent Person

g. Glovebag>

h. Duct Tape

i. Disposal Containers

(1) Disposal bags
(2) Fiberboard drums
(3) Paperboard boxes

j. Sheet Plastic

(1) Polyethylene Sheet - General
(2) Polyethylene Sheet - Flame Resistant
(3) Polyethylene Sheet - Reinforced

k. Wetting Agent

(1) Amended Water
(2) Removal encapsulant

l. Strippable Coating

m. Prefabricated Decontamination Unit

n. Other items

o. Chemical encapsulant

p. Chemical encasement materials

q. Material Safety Data Sheets (for all chemicals proposed)

Site Layout; G
Descriptions, detail project drawings, and site layout to include worksite containment area techniques as prescribed on applicable SET-UP DETAIL SHEETS, (See http://www.hnd.army.mil "TECHINFO" or http://www.usace.army.mil/inet/usace-docs/eng-phamphlets/ep1110-1-11/enture.pdf) local exhaust ventilation system locations, decontamination and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities (electrical, water, sewer) and boundaries of each regulated area.

Qualifications; G,

A written report providing evidence of qualifications for personnel, facilities and equipment assigned to the work.

Training Program; [__G___],

A copy of the written project site-specific training material as indicated in 29 CFR 1926, Section .1101 that will be used to train onsite employees. The training document shall be signed by the Contractor's Designated IH and Competent Person.

Medical Requirements; [_G____],

Physician's written opinion.
Physician's signed written opinion including the physicians' address and telephone number.

<TAI OPT=DEMOLITION>Encapsulants; G,

Certificates stating that encapsulants meet the applicable specified performance requirements.

SD-06 Test Reports

Exposure Assessment and Air Monitoring; G,

Initial exposure assessments, negative exposure assessments, air-monitoring results and documentation.

Local Exhaust Ventilation; [___G__],

Pressure differential recordings.
Licenses, Permits and Notifications; G, Licenses, permits, and notifications.

SD-07 Certificates

Vacuum, Filtration and Ventilation Equipment; [__G___],

Manufacturer's certifications showing compliance with ANSI Z9.2 for:

a. Vacuums.

b. Water filtration equipment.

c. Ventilation equipment.

d. Other equipment required to contain airborne asbestos fibers.
Respiratory Protection Program; GA.

Records of the respirator program including fit test data.

Cleanup and Disposal Records; GA.

Waste shipment records. Weigh bills and delivery tickets shall be furnished for information only.

1.5 QUALIFICATIONS

1.5.1 Written Qualifications and Organization Report

The Contractor shall furnish a written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's Project Supervisor, Designated Competent Person, supervisors and workers; Designated IH (person assigned to project and firm name); independent testing laboratory (including name of firm, principal, and analysts who will perform analyses); all subcontractors to be used including disposal transportation and disposal facility firms, subcontractor supervisors, subcontractor workers; and any others assigned to perform asbestos abatement and support activities. The report shall include an organization chart showing the Contractor's staff organization for this project by name and title, chain of command and reporting relationship with all subcontractors. The report shall be signed by the Contractor, the Contractor's onsite project manager, Designated Competent Person, Designated IH, designated testing laboratory and the principals of all subcontractors to be used. The Contractor shall include the following statement in the report: "By signing this report I certify that the personnel I am responsible for during the course of this project fully understand the contents of 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and the federal, state and local requirements specified in paragraph SAFETY AND HEALTH PROGRAM AND PLANS for those asbestos abatement activities that they will be involved in."

1.5.2 Specific Requirements

The Contractor shall designate in writing, personnel meeting the following qualifications:

a. Designated Competent Person: The name, address, telephone number, and resume of the Contractor's Designated Competent Person shall be provided. Evidence that the full-time Designated Competent Person is qualified in accordance with 29 CFR 1926, Sections .32 and .1101, has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and is experienced in the administration and supervision of asbestos abatement projects, including exposure assessment and monitoring, work practices, abatement methods, protective measures for personnel, setting up and inspecting asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, notification of other employees onsite, etc. The duties of the Competent Person shall include the following: controlling entry to and exit from the regulated area; supervising any employee exposure monitoring required by 29 CFR 1926, Section .1101; ensuring that all employees working within a regulated area wear the appropriate personal protective equipment (PPE), are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and

decontamination procedures specified; and ensuring that engineering controls in use are in proper operating conditions and are functioning properly. The Designated Competent Person shall be responsible for compliance with applicable federal, state and local requirements, the Contractor's Accident Prevention Plan and Asbestos Hazard Abatement Plan. The Designated Competent Person shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that this person has a minimum of 2 years of on-the-job asbestos abatement experience relevant to OSHA competent person requirements. The Designated Competent Person shall be onsite at all times during the conduct of this project.

b. Project and Other Supervisors: The Contractor shall provide the name, address, telephone number, and resume of the Project Supervisor and other supervisors who have responsibility to implement the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses, the authority to direct work performed under this contract and verify compliance, and have EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Project Supervisor and other supervisors shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Contractor shall submit evidence that the Project Supervisor has a minimum of 2 years of on-the-job asbestos abatement experience relevant to project supervisor responsibilities and the other supervisors have a minimum of 1 year on-the-job asbestos abatement experience commensurate with the responsibilities they will have on this project.

c. Designated (Independent) Industrial Hygienist: The Contractor shall provide the name, address, telephone number, resume and other information specified below for the Industrial Hygienist (IH) selected to prepare the Contractor's Asbestos Hazard Abatement Plan, prepare and perform training, direct air monitoring and assist the Contractor's Competent Person in implementing and ensuring that safety and health requirements are complied with during the performance of all required work. The Designated IH shall be a person who is board certified in the practice of industrial hygiene as determined and documented by the American Board of Industrial Hygiene (ABIH), has EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C, and has a minimum of 2 yearsof comprehensive experience in planning and overseeing asbestos abatement activities. The Designated IH shall provide, and the Contractor shall submit, the "Contractor/Supervisor" course completion certificate and the most recent certificate for required refresher training with the employee "Certificate of Worker Acknowledgment" required by this paragraph. The Designated IH shall be completely independent from the Contractor according to federal, state, or local regulations; that is, shall not be a

Contractor's employee or be an employee or principal of a firm in a business relationship with the Contractor negating such independent status. A copy of the Designated IH's current valid ABIH certification shall be included. The Designated IH shall be available for emergencies. In addition, the Designated IH shall review, and the Contractor shall submit, the name, address, telephone numbers and resumes of additional IH's and industrial hygiene technicians (IHT) who will be employed by the Abatement Contractor and prepare those who will be assisting the Designated IH in performing onsite tasks. IHs and IHTs supporting the Designated IH shall have a minimum of 2 yearsof practical onsite asbestos abatement experience. The formal reporting relationship between the Designated IH and the support IHs and IHTs, the Designated Competent Person, and the Contractor shall be indicated.

d. Asbestos Abatement Workers: Asbestos abatement workers shall meet the requirements contained in 29 CFR 1926, Section .1101, 40 CFR 61, Subpart M, and other applicable federal, state and local requirements. Worker training documentation shall be provided as required on the "Certificate of Workers Acknowledgment" in this paragraph.

e. Worker Training and Certification of Worker Acknowledgment: Training documentation will be required for each employee who will perform OSHA Class I, Class II, Class III, or Class IV asbestos abatement operations. Such documentation shall be submitted on a Contractor generated form titled "Certificate of Workers Acknowledgment", to be completed for each employee in the same format and containing the same information as the example certificate at the end of this section. Training course completion certificates (initial and most recent update refresher) required by the information checked on the form shall be attached.

f. Physician: The Contractor shall provide the name, medical qualifications, address, telephone number and resume of the physician who will or has performed the medical examinations and evaluations of the persons who will conduct the asbestos abatement work tasks. The physician shall be currently licensed by the state where the workers will be or have been examined, have expertise in pneumoconiosis and shall be responsible for the determination of medical surveillance protocols and for review of examination/test results performed in compliance with 29 CFR 1926, Section .1101 and paragraph MEDICAL REQUIREMENTS. The physician shall be familiar with the site's hazards and the scope of this project.

g. First Aid and CPR Trained Persons: The names of at least 2 persons who are currently trained in first aid and CPR by the American Red Cross or other approved agency shall be designated and shall be onsite at all times during site operations. They shall be trained in universal precautions and the use of PPE as described in the Bloodborne Pathogens Standard of 29 CFR 1910, Section .1030 and shall be included in the Contractor's Bloodborne Pathogen Program. These persons may perform other duties but shall be immediately available to render first aid when needed. A copy of each designated person's current valid First Aid and CPR certificate shall be provided.

h. Independent Testing Laboratory: The Contractor shall provide the name, address and telephone number of the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor, shall be submitted:

(1) Phase contrast microscopy (PCM): The laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, the most current version of NIOSH Pub No. 84-100 Method 7400, II REMOVAL>and NIOSH Pub No. 84-100 Method 7402, transmission electron microscopy (TEM); </TAI>the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program; the names of the selected microscopists who will analyze airborne samples by PCM with verified documentation of their proficiency to conduct PCM analyses by being judged proficient in counting samples as current participating analysts in the AIHA PAT Program, and having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent) with a copy of course completion certificate provided; when the PCM analysis is to be conducted onsite, documentation shall be provided certifying that the onsite analyst meets the same requirements.

(2) Polarized light microscopy (PLM): The laboratory is fully equipped and proficient in conducting PLM analyses of suspect ACM bulk samples in accordance with 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for bulk asbestos analysis and will use analysts (names shall be provided) with demonstrated proficiency to conduct PLM to include its application to the identification and quantification of asbestos content.

(3) Transmission electron microscopy (TEM): The laboratory is fully equipped and proficient in conducting TEM analysis of airborne samples using the mandatory method specified by 40 CFR 763, Subpart E, Appendix E; the laboratory is currently accredited by NIST under the NVLAP for airborne sample analysis of asbestos by TEM; the laboratory will use analysts (names shall be provided) that are currently evaluated as competent with demonstrated proficiency under the NIST NVLAP for airborne sample analysis of asbestos by TEM.

(4) PCM/TEM: The laboratory is fully equipped and each analyst (name shall be provided) possesses demonstrated proficiency in conducting PCM and TEM analysis of airborne samples using NIOSH Pub No. 84-100Method 7400 PCM and NIOSH Pub No. 84-100 Method 7402 (TEM confirmation of asbestos content of PCM results) from the same filter.

i. Disposal Facility, Transporter: The Contractor shall provide written evidence that the landfill to be used is approved for

asbestos disposal by the state and local regulatory agencies. Copies of signed agreements between the Contractor (including subcontractors and transporters) and the asbestos waste disposal facility to accept and dispose of all asbestos containing waste generated during the performance of this contract shall be provided. Qualifications shall be provided for each subcontractor or transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos. The Contractor and transporters shall meet the DOT requirements of 49 CFR 171, 49 CFR 172, and 49 CFR 173 as well as registration requirements of 49 CFR 107 and other applicable state or local requirements. The disposal facility shall meet the requirements of 40 CFR 61, Sections .154 or .155, as required in 40 CFR 61, Section .150(b), and other applicable state or local requirements.

1.5.3 Federal, State or Local Citations on Previous Projects

The Contractor and all subcontractors shall submit a statement, signed by an officer of the company, containing a record of any citations issued by Federal, State or local regulatory agencies relating to asbestos activities (including projects, dates, and resolutions); a list of penalties incurred through non-compliance with asbestos project specifications, including liquidated damages, overruns in scheduled time limitations and resolutions; and situations in which an asbestos-related contract has been terminated (including projects, dates, and reasons for terminations). If there are none, a negative declaration signed by an officer of the company shall be provided.

1.6 REGULATORY REQUIREMENTS

In addition to detailed requirements of this specification, work performed under this contract shall comply with EM 385-1-1, applicable federal, state, and local laws, ordinances, criteria, rules and regulations regarding handling, storing, transporting, and disposing of asbestos waste materials. This includes, but is not limited to, OSHA standards, 29 CFR 1926, especially Section .1101, 40 CFR 61, Subpart M and 40 CFR 763. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirements shall apply. North Carolina state laws, rules and regulations regarding demolition, removal, encapsulation, construction alteration, repair, maintenance, renovation, spill/emergency cleanup, housekeeping, handling, storing, transporting and disposing of asbestos material apply.

1.7 SAFETY AND HEALTH PROGRAM AND PLANS

The Contractor shall develop and submit a written comprehensive site-specific Accident Prevention Plan at least 30 days prior to the preconstruction conference. The Accident Prevention Plan shall address requirements of EM 385-1-1, Appendix A, covering onsite work to be performed by the Contractor and subcontractors. The Accident Prevention Plan shall incorporate an Asbestos Hazard Abatement Plan, and Activity Hazard Analyses as separate appendices into 1 site specific Accident Prevention Plan document. Any portions of the Contractor's overall Safety and Health

Program that are referenced in the Accident Prevention Plan, e.g., respirator program, hazard communication program, confined space entry program, etc., shall be included as appendices to the Accident Prevention Plan. The plan shall take into consideration all the individual asbestos abatement work tasks identified in Table 1. The plan shall be prepared, signed (and sealed, including certification number if required), and dated by the Contractor's Designated IH, Competent Person, and Project Supervisor.

1.7.1 Asbestos Hazard Abatement Plan Appendix

The Asbestos Hazard Abatement Plan appendix to the Accident Prevention Plan shall include, but not be limited to, the following:

a. The personal protective equipment to be used;

b. The location and description of regulated areas including clean and dirty areas, access tunnels, and decontamination unit CLASS II REMOVAL (clean room, shower room, equipment room, storage areas such as load-out unit);

c. Initial exposure assessment in accordance with 29 CFR 1926, Section .1101;

d. Level of supervision;

e. Method of notification of other employers at the worksite;

f. Abatement method to include containment and control procedures;

g. Interface of trades involved in the construction;

h. Sequencing of asbestos related work;

i. Storage and disposal procedures and plan;

j. Type of wetting agent and asbestos encapsulant to be used;

k. Location of local exhaust equipment;

l. Air monitoring methods (personal, environmental and clearance;

m. Bulk sampling and analytical methods (if required);

n. A detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber concentrations;

o. Fire and medical emergency response procedures;

p. The security procedures to be used for all regulated areas.

1.7.2 Activity Hazard Analyses Appendix

Activity Hazard Analyses, for each major phase of work, shall be submitted and updated during the project. The Activity Hazard Analyses format shall be in accordance with EM 385-1-1 (Figure 1-1). The analysis shall define the activities to be performed for a major phase of work, identify the sequence of work, the specific hazards anticipated, and the control measures

to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the Activity Hazard Analyses has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the onsite Government representatives. The Activity Hazard Analyses shall be continuously reviewed and, when appropriate, modified to address changing site conditions or operations.

1.8 PRECONSTRUCTION CONFERENCE AND ONSITE SAFETY

The Contractor and the Contractor's Designated Competent Person, Project Supervisor, and Designated IH shall meet with the Contracting Officer prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's submitted Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses appendices. Deficiencies in the Accident Prevention Plan will be discussed and the Accident Prevention Plan shall be revised to correct the deficiencies and resubmitted for acceptance. Any changes required in the specification as a result of the Accident Prevention Plan shall be identified specifically in the plan to allow for free discussion and acceptance by the Contracting Officer, prior to the start of work. Onsite work shall not begin until the Accident Prevention Plan has been accepted. A copy of the written Accident Prevention Plan shall be maintained onsite. Changes and modifications to the accepted Accident Prevention Plan shall be made with the knowledge and concurrence of the Designated IH, the Project Supervisor, Designated Competent Person, and the Contracting Officer. Should any unforeseen hazard become evident during the performance of the work, the Designated IH shall bring such hazard to the attention of the Project Supervisor, Designated Competent Person, and the Contracting Officer, both verbally and in writing, for resolution as soon as possible. In the interim, all necessary action shall be taken by the Contractor to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public, and the environment. Once accepted by the Contracting Officer, the Accident Prevention Plan, including the Asbestos Hazard Abatement Plan and Activity Hazard Analyses will be enforced as if an addition to the contract. Disregarding the provisions of this contract or the accepted Accident Prevention Plan will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

1.9 SECURITY

Fenced and locked security area shall be provided for each regulated area. A log book shall be kept documenting entry into and out of the regulated area. Entry into regulated areas shall only be by personnel authorized by the Contractor and the Contracting Officer. Personnel authorized to enter regulated areas shall be trained, be medically evaluated, and wear the required personal protective equipment for the specific regulated area to be entered.

1.10 MEDICAL REQUIREMENTS

Medical requirements shall conform to 29 CFR 1926, Section .1101 and the state of **North Carolina**.

1.10.1 Medical Examinations

Before being exposed to airborne asbestos fibers, workers shall be provided with a medical examination as required by 29 CFR 1926, Section .1101 and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

1.10.1.1 Information Provided to the Physician

The Contractor shall provide the following information in writing to the examining physician:

a. A copy of 29 CFR 1926, Section .1101 and Appendices D, E, G, and I;

b. A description of the affected employee's duties as they relate to the employee's exposure;

c. The employee's representative exposure level or anticipated exposure level;

d. A description of any personal protective and respiratory equipment used or to be used;

e. Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

1.10.1.2 Written Medical Opinion

For each worker, a written medical opinion prepared and signed by a licensed physician indicating the following:

a. Summary of the results of the examination.

b. The potential for an existing physiological condition that would place the employee at an increased risk of health impairment from exposure to asbestos.

c. The ability of the individual to wear personal protective equipment, including respirators, while performing strenuous work tasks under cold and/or heat stress conditions.

d. A statement that the employee has been informed of the results of the examination, provided with a copy of the results, informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure, and informed of any medical condition that may result from asbestos exposure.

1.10.2 Medical and Exposure Records

Complete and accurate records shall be maintained of each employee's medical examinations, medical records, and exposure data, as required by 29 CFR 1910, Section .1910.20 and 29 CFR 1926, Section .1101 for a period of 50 years after termination of employment. Records of the required medical examinations and exposure data shall be made available, for inspection and copying, to the Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee. A copy of the required medical certification for each employee shall be maintained on file at the worksite for review, as requested by the Contracting Officer or the representatives.

1.11 TRAINING PROGRAM

1.11.1 General Training Requirements

The Contractor shall establish a training program as specified by EPA Model Accreditation Plan (MAP), training requirements at 40 CFR 763, Subpart E, Appendix C, the State of **North Carolina Chapter 130A Public Health Article 19**, OSHA requirements at 29 CFR 1926, Section .1101(k)(9), and this specification. Contractor employees shall complete the required training for the type of work they are to perform and such training shall be documented and provided to the Contracting Officer as specified in paragraph QUALIFICATIONS.

1.11.2 Project Specific Training

Prior to commencement of work, each worker shall be instructed by the Contractor's Designated IH and Competent Person in the following project specific training:

a. The hazards and health effects of the specific types of ACM to be abated;

b. The content and requirements of the Contractor's Accident Prevention Plan to include the Asbestos Hazard Abatement Plan and Activity Hazard Analyses and site-specific safety and health precautions;

c. Hazard Communication Program;

d. Hands-on training for each asbestos abatement technique to be employed;

e. Heat and/or cold stress monitoring specific to this project;

f. Air monitoring program and procedures;

g. Medical surveillance to include medical and exposure record-keeping procedures;

h. The association of cigarette smoke and asbestos-related disease;

i. Security procedures;

j. Specific work practice controls and engineering controls required for each Class of work in accordance with 29 CFR 1926, Section .1101.

1.12 RESPIRATORY PROTECTION PROGRAM

The Contractor's Designated IH shall establish in writing, and implement a respiratory protection program in accordance with 29 CFR 1926, Section .1101, 29 CFR 1910, Section .134, ANSI Z88.2, CGA G-7, CGA G-7.1 and DETAIL SHEET 12. The Contractor's Designated IH shall establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

a. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.

b. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.

c. Medical evaluation of each user to verify that the worker may be assigned to an activity where respiratory protection is required.

d. Training in the proper use and limitations of respirators.

e. Respirator fit-testing, i.e., quantitative, qualitative and individual functional fit checks.

f. Regular cleaning and disinfection of respirators.

g. Routine inspection of respirators during cleaning and after each use when designated for emergency use.

h. Storage of respirators in convenient, clean, and sanitary locations.

i. Surveillance of regulated area conditions and degree of employee exposure (e.g., through air monitoring).

j. Regular evaluation of the continued effectiveness of the respiratory protection program.

k. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with valve function; prescription eye wear usage; contact lenses usage; etc.).

l. Proper training in putting on and removing respirators.

1.12.1 Respiratory Fit Testing

A qualitative or quantitative fit test conforming to 29 CFR 1926, Section 1101, Appendix C shall be conducted by the Contractor's Designated IH for each Contractor worker required to wear a respirator, and for the Contracting Officer and authorized visitors who enter a regulated area where respirators are required to be worn. A respirator fit test shall be performed for each worker wearing a negative-pressure respirator prior to initially wearing a respirator on this project and every 6 months thereafter. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, or of full-facepiece air purifying respirators where they are worn at levels at which half-facepiece air purifying respirators are permitted. If physical changes develop that will affect the fit, a new fit test for the worker shall be performed. Functional fit checks shall be performed by employees each time a respirator is put on and in accordance with the manufacturer's recommendation.

1.12.2 Respirator Selection and Use Requirements

The Contractor shall provide respirators, and ensure that they are used as required by 29 CFR 1926, Section .1101 and in accordance with the manufacturer's recommendations. Respirators shall be jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (MSHA/NIOSH), or by NIOSH, under the provisions of 42 CFR 84, for use in environments containing airborne asbestos fibers. Personnel who handle ACM, enter regulated areas that require the wearing of a respirator, or who are otherwise carrying out abatement activities that require the wearing of a respirator, shall be provided with approved respirators that are fully protective of the worker at the measured or anticipated airborne asbestos concentration level to be encountered. For air-purifying respirators, the particulate filter portion of the cartridges or canister approved for use in airborne asbestos environments shall be high-efficiency particulate air (formerly known as HEPA). The filter cartridge type shall be P-100, N-100 or R-100. The initial respirator selection and the decisions regarding the upgrading or downgrading of respirator type shall be made by the Contractor's Designated IH based on the measured or anticipated airborne asbestos fiber concentrations to be encountered and whether organic vapors from spray adhesives or other compounds will be encountered during the abatement set-up and removal process. Recommendations made by the Contractor's Designated IH to downgrade respirator type shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person in consultation with the Designated IH, shall have the authority to take immediate action to upgrade or downgrade respiratory type when there is an immediate danger to the health and safety of the wearer. Respirators shall be used in the following circumstances:

a. During all Class I asbestos jobs.

b. During all Class II work where the ACM is not removed in a substantially intact state.

c. During all Class II and III work which is not performed using wet methods. Respirators need not be worn during removal of ACM from sloped roofs when a negative exposure assessment has been made and ACM is removed in an intact state.

d. During all Class II and III asbestos jobs where the Contractor does not produce a negative exposure assessment.

e. During all Class III jobs where TSI or surfacing ACM is being disturbed.

f. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.

g. During all work where employees are exposed above the PEL-TWA or PEL-Excursion Limit.

h. In emergencies

1.12.3 Class I Work

The Contractor shall provide: (1) a tight-fitting, powered air purifying respirator equipped with high efficiency filters, or (2) a full-facepiece supplied air respirator operated in the pressure demand mode, equipped with HEPA egress cartridges, or (3) an auxiliary positive pressure self-contained breathing apparatus, for all employees within the regulated area where Class I work is being performed; provided that a negative exposure assessment has not been produced, and that the exposure level will not exceed 1 f/cc as an 8-hour time weighted average. A full-facepiece supplied air respirator, operated in the pressure demand mode, equipped with an auxiliary positive pressure self-contained breathing apparatus shall be provided under such conditions, if the exposure assessment indicates exposure levels above 1 f/cc as an 8-hour time weighted average.

1.12.4 Class II and III Work

The Contractor shall provide an air purifying respirator, other than a disposable respirator, equipped with high-efficiency filters whenever the employee performs Class II and III asbestos jobs where the Contractor does not produce a negative exposure assessment; and Class III jobs where TSI or surfacing ACM is being disturbed.

1.12.5 Sanitation

Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

1.13 HAZARD COMMUNICATION PROGRAM

A hazard communication program shall be established and implemented in accordance with 29 CFR 1926, Section .59. Material safety data sheets (MSDSs) shall be provided for all hazardous materials brought onto the worksite. One copy shall be provided to the Contracting Officer and 1 copy shall be included in the Contractor's Hazard Communication Program.

1.14 LICENSES, PERMITS AND NOTIFICATIONS

1.14.1 General Legal Requirements

Necessary licenses, permits and notifications shall be obtained in conjunction with the project's asbestos abatement, transportation and disposal actions and timely notification furnished of such actions as required by federal, state, regional, and local authorities. The Contractor shallNorth Carolina state OSHA programand the Contracting Officer in writing, at least 10 days prior to the commencement of work, in accordance with 40 CFR 61, Subpart M, and state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. Notification shall be by Certified Mail, Return Receipt Requested. The Contractor shall furnish copies of the receipts to the Contracting Officer, in writing, prior to the commencement of work. Local fire department shall be notified 3 days before fire-proofing material is removed from a building and the notice shall specify whether or not the material contains asbestos. A copy of the rental company's written acknowledgment and agreement shall be provided as required by paragraph RENTAL EQUIPMENT. For licenses, permits, and notifications that the Contractor is responsible for obtaining, the Contractor shall pay any associated fees or other costs incurred.

1.14.2 Litigation and Notification

The Contractor shall notify the Contracting Officer if any of the following occur:

a. The Contractor or any of the subcontractors are served with notice of violation of any law, regulation, permit or license which relates to this contract;

b. Proceedings are commenced which could lead to revocation of related permits or licenses; permits, licenses or other Government authorizations relating to this contract are revoked;

c. Litigation is commenced which would affect this contract;

d. The Contractor or any of the subcontractors become aware that their equipment or facilities are not in compliance or may fail to comply in the future with applicable laws or regulations.

.15 PERSONAL PROTECTIVE EQUIPMENT

Two complete sets of personal protective equipment shall be made available to the Contracting Officer and authorized visitors for entry to the regulated area. Contracting Officer and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment and the Contractor shall ensure that it is worn properly. The Contractor's Designated IH and Designated Competent Person shall select and approve all the required personal protective clothing and equipment to be used.

1.15.1 Respirators

Respirators shall be in accordance with paragraph RESPIRATORY PROTECTION PROGRAM.

1.15.2 Whole Body Protection

Personnel exposed to airborne concentrations of asbestos that exceed the PELs, or for all OSHA Classes of work for which a required negative exposure assessment is not produced, shall be provided with whole body protection and such protection shall be worn properly. The Contractor's Designated IH and Competent Person shall select and approve the whole body protection to be used. The Competent Person shall examine work suits worn by employees at least once per work shift for rips or tears that may occur during performance of work. When rips or tears are detected while an employee is working, rips and tears shall be immediately mended, or the work suit shall be immediately replaced. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the regulated area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the regulated area or be properly laundered in accordance with 29 CFR 1926, Section .1101. Whole body protection used for asbestos abatement shall not be removed from the worksite by a worker to be cleaned. Recommendations made by the Contractor's Designated IH to downgrade whole body protection shall be submitted in writing to the Contracting Officer. The Contractor's Designated Competent Person, in consultation with the Designated IH, has the authority to take immediate action to upgrade or downgrade whole body protection when there is an immediate danger to the health and safety of the wearer.

1.15.2.1 Coveralls

Disposable-impermeableor Disposable-breathable coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles. See DETAIL SHEET 13.

1.15.2.2 Underwear

Disposable underwear shall be provided. If reusable underwear are used, they shall be disposed of as asbestos contaminated waste or laundered in accordance with 29 CFR 1926, Section .1101. Asbestos abatement workers shall not remove contaminated reusable underwear worn during abatement of ACM from the site to be laundered.

1.15.2.3 Work Clothing

An additional coverall shall be provided when the abatement and control method employed does not provide for the exit from the regulated area directly into an attached decontamination unit. Cloth work clothes for wear under the protective coverall, and foot coverings, shall be provided when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated waste or properly laundered in accordance with 29 CFR 1926, Section .1101.

1.15.2.4 Gloves

Gloves shall be provided to protect the hands. Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) a suitable glove shall be provided and used.

1.15.2.5 Foot Coverings

Cloth socks shall be provided and worn next to the skin. Footwear, as required by OSHA and EM 385-1-1, that is appropriate for safety and health hazards in the area shall be worn. Rubber boots shall be used in moist or wet areas. Reusable footwear removed from the regulated area shall be thoroughly decontaminated or disposed of as ACM waste. Disposable protective foot covering shall be disposed of as ACM waste. If rubber boots are not used, disposable foot covering shall be provided.

1.15.2.6 Head Covering

Hood type disposable head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the regulated area after being thoroughly decontaminated.

1.15.2.7 Protective Eye Wear

Eye protection provided shall be in accordance with ANSI Z87.1.

1.16 HYGIENE FACILITIES AND PRACTICES

The Contractor shall establish a decontamination area for the decontamination of employees, material and equipment. The Contractor shall ensure that employees enter and exit the regulated area through the decontamination area.

1.16.1 Shower Facilities

Shower facilities, when provided, shall comply with 29 CFR 1910, Section .141(d)(3).

1.16.2 3-Stage Decontamination Area

A temporary negative pressure decontamination unit that is adjacent and attached in a leak-tight manner to the regulated area shall be provided as described in SET-UP DETAIL SHEET Numbers 22 and 23. The decontamination unit shall have an equipment room and a clean room separated by a shower that complies with 29 CFR 1910, Section .141 (unless the Contractor can demonstrate that such facilities are not feasible). Equipment and surfaces of containers filled with ACM shall be cleaned prior to removing them from the equipment room or area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste. Two separate lockers shall be provided for each asbestos worker, one in the equipment room and one in the clean room. Warm water shall be available. The Contractor shall provide a minimum 160 L electric water heater with minimum recovery rate of 80 L per hour and a temperature controller for each showerhead. The Contractor shall provide a minimum of 2 showers. Instantaneous type in-line water heater may be incorporated at each shower head in lieu of hot water heater, upon

approval by the Contracting Officer. Flow and temperature controls shall be located within the shower and shall be adjustable by the user. The wastewater pump shall be sized for 1.25 times the showerhead flow-rate at a pressure head sufficient to satisfy the filter head loss and discharge line losses. The pump shall supply a minimum 1.6 L/s flow with 10.7 m of pressure head. Used shower water shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material, per DETAIL SHEETS 9 and 14. Filtered water shall be discharged to the sanitary system. Wastewater filters shall be installed in series with the first stage pore size of 20 microns and the second stage pore size of 5 microns. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet-wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or shall be laundered in accordance with 29 CFR 1926, Section .1101. (Detail Sheets and Set-Up Details that are referenced in this specification can be obtained from the Internet at http://www.hnd.usace.army.mil. Click on “TECHINFO” and search list for asbestos.)

1.16.3 Load-Out Unit

A temporary load-out unit that is adjacent and connected to the regulated area and access tunnel shall be provided as described in DETAIL SHEET Number 20 and 25. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The load-out unit shall be attached in a leak-tight manner to each regulated area. Surfaces of the load-out unit and access tunnel shall be adequately wet-wiped 2 times after each shift change. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.4 Single Stage Decontamination Area

A decontamination area (equipment room/area) shall be provided for Class I work involving less than 7.5 m or 0.9 square meters of TSI or surfacing ACM, and for Class II and Class III asbestos work operations where exposures exceed the PELs or where there is no negative exposure assessment produced before the operation. The equipment room or area shall be adjacent to the regulated area for the decontamination of employees, material, and their equipment which is contaminated with asbestos. The equipment room or area shall consist of an area covered by an impermeable drop cloth on the floor or horizontal working surface. The area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area. Surfaces of the equipment room shall be wet wiped 2 times after each shift. Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.16.5 Decontamination Requirements for Class IV Work

The Contractor shall ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area, or the Contractor shall provide alternate decontamination area

facilities for employees cleaning up debris and material which is TSI or surfacing ACM.

1.16.6 Decontamination Area Entry Procedures

The Contractor shall ensure that employees entering the decontamination area through the clean room or clean area:

a. Remove street clothing in the clean room or clean area and deposit it in lockers.

b. Put on protective clothing and respiratory protection before leaving the clean room or clean area.

c. Pass through the equipment room to enter the regulated area.

1.16.7 Decontamination Area Exit Procedures

The Contractor shall ensure that the following procedures are followed:

a. Before leaving the regulated area, respirators shall be worn while employees remove all gross contamination and debris from their work clothing using a HEPA vacuum.

b. Employees shall remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers (see Detail Sheets 9 and 14) for disposal and/or laundering.

c. Employees shall not remove their respirators in the equipment room.

d. Employees shall shower prior to entering the clean room. If a shower has not been located between the equipment room and the clean room or the work is performed outdoors, the Contractor shall ensure that employees engaged in Class I asbestos jobs: a) Remove asbestos contamination from their work suits in the equipment room or decontamination area using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or b) Remove their contaminated work suits in the equipment room, without cleaning worksuits, and proceed to a shower that is not adjacent to the work area.

e. After showering, employees shall enter the clean room before changing into street clothes.

1.16.8 Lunch Areas

The Contractor shall provide lunch areas in which the airborne concentrations of asbestos are below 0.01 f/cc.

1.16.9 Smoking

Smoking, if allowed by the Contractor, shall only be permitted in designated areas approved by the Contracting Officer.

1.17 REGULATED AREAS

All Class I, II, and III asbestos work shall be conducted within regulated areas. The regulated area shall be demarcated to minimize the number of persons within the area and to protect persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they shall demarcate the regulated area. Access to regulated areas shall be limited to authorized persons. The Contractor shall control access to regulated areas, ensure that only authorized personnel enter, and verify that Contractor required medical surveillance, training and respiratory protection program requirements are met prior to allowing entrance.

1.18 WARNING SIGNS AND TAPE

Warning signs and tape printed in English and in pictographs, shall be provided at the regulated boundaries and entrances to regulated areas. The Contractor shall ensure that all personnel working in areas contiguous to regulated areas comprehend the warning signs. Signs shall be located to allow personnel to read the signs and take the necessary protective steps required before entering the area. Warning signs, as shown and described in DETAIL SHEET 11, shall be in vertical format conforming to 29 CFR 1910 and 29 CFR 1926, Section .1101, a minimum of 500 by 350 mm, and displaying the following legend in the lower panel:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

Spacing between lines shall be at least equal to the height of the upper of any two lines. Warning tape shall be provided as shown and described on DETAIL SHEET 11. Decontamination unit signage shall be as shown and described on DETAIL SHEET 15.

1.19 WARNING LABELS

Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements are acceptable. Warning labels shall be as described in DETAIL SHEET 14, shall conform to 29 CFR 1926, Section .1101 and shall be of sufficient size to be clearly legible displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

1.20 LOCAL EXHAUST VENTILATION

Local exhaust ventilation units shall conform to ANSI Z9.2 and 29 CFR 1926, Section .1101. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586. Filter shall be UL labeled.

1.21 TOOLS

Vacuums shall be leak proof to the filter, equipped with HEPA filters, of sufficient capacity and necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system, or has otherwise been approved for use by the Contracting Officer. Residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from regulated areas.

1.22 RENTAL EQUIPMENT

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

1.23 AIR MONITORING EQUIPMENT

The Contractor's Designated IH shall approve air monitoring equipment to be used to collect samples. The equipment shall include, but shall not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to 16 liters per minute when equipped with a sampling train of tubing and filter cassette.

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute when equipped with a sampling train of tubing and filter cassette, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow, even as filter resistance increases due to accumulation of fiber and debris on the filter surface.

c. Single use standard 25 mm diameter cassette, open face, 0.8 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive extension cowl, and shrink bands, to be used with low flow pumps in accordance with 29 CFR 1926, Section .1101 for personal air sampling.

d. Single use standard 25 mm diameter cassette, open face, 0.45 micron pore size, mixed cellulose ester membrane filters and cassettes with 50 mm electrically conductive cowl, and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH Pub No. 84-100 Methods 7400 and 7402, (and the transmission electric microscopy method specified at 40 CFR 763 if required).

e. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette.

f. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 20 to plus 60 degrees C and traceable to a NIST primary standard.

1.24 EXPENDABLE SUPPLIES

1.24.1 Glovebag

Glovebags shall be provided as described in 29 CFR 1926, Section .1101 and SET-UP DETAIL SHEET 10. The glovebag assembly shall be 0.15 mm thick plastic, prefabricated and seamless at the bottom with preprinted OSHA warning label.

1.24.2 Duct Tape

Industrial grade duct tape of appropriate widths suitable for bonding sheet plastic and disposal container shall be provided.

1.24.3 Disposal Containers

Leak-tight (defined as solids, liquids, or dust that cannot escape or spill out) disposal containers shall be provided for ACM wastes as required by 29 CFR 1926 Section .1101 and DETAIL SHEETS 9A, 9B, 9C and 14.

1.24.4 Disposal Bags

Leak-tight bags, 0.15 mm thick, shall be provided for placement of asbestos generated waste as described in DETAIL SHEET 9A.

1.24.5 Fiberboard Drums

Fiberboard drums with secured lids shall be [used whenever asbestos waste bags are transferred from the containment/loading area of the abated building to any temporary onsite storage area or during other unsecured transportation prior to final hauling.

1.24.6 Cardboard Boxes

Heavy-duty corrugated cardboard boxes, coated with plastic or wax to retard deterioration from moisture, shall be provided as described in DETAIL SHEET 9C, if required by state and local requirements. Boxes shall fit into selected ACM disposal bags. Filled boxes shall be sealed leak-tight with duct tape.

1.24.7 Sheet Plastic

Sheet plastic shall be polyethylene of 0.15 mm minimum thickness and shall be provided in the largest sheet size necessary to minimize seams,as indicated on the project drawings. Film shall be clear frosted and conform to ASTM D 4397, except as specified below:

1.24.7.1 Flame Resistant

Where a potential for fire exists, flame-resistant sheets shall be provided. Film shall be clear or frosted for containment and black for shower or dressing areas and shall conform to the requirements of NFPA 701.

1.24.7.2 Reinforced

Reinforced sheets shall be provided where high skin strength is required, such as where it constitutes the only barrier between the regulated area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between 2 layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.24.8 Amended Water

Amended water shall meet the requirements of ASTM D 1331.

1.24.9 Mastic Removing Solvent

Mastic removing solvent shall be nonflammable and shall not contain methylene chloride, glycol ether, or halogenated hydrocarbons. Solvents used onsite shall have a flash point greater than 60 degrees C.

1.24.10 Leak-tight Wrapping

Two layers of 0.15 mm minimum thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags as described in DETAIL SHEET 9B. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

<TAI OPT=CLASS II REMOVAL>1.24.11 Viewing Inspection Window

Where feasible, a minimum of 1 clear, 3 mm thick, acrylic sheet, 450 by 610 mm , shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure. The windows shall be sealed leak-tight with industrial grade duct tape.

1.24.12 Wetting Agents

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM greater than or equal to that provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS.

1.24.13 Strippable Coating

Strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping, at the completion of work. This work shall only be done in well ventilated areas.

1.25 MISCELLANEOUS ITEMS

A sufficient quantity of other items, such as, but not limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of containments, UL approved temporary electrical equipment, material and cords, ground fault circuit interrupters, water hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc., shall be provided.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity Zero Mortality	Univ. of Pittsburgh Protocol
Life Expectancy, 20 yrs Accelerated Aging Test	ASTM C 732
Permeability, Min. 23 ng per Pa-sec-square m	ASTM E 96

Additional Requirements for Bridging Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test, 730 N/m	ASTM E 736
Fire Resistance, Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance, Min. 4.7 N-m (Gardner Impact Test)	ASTM D 2794
Flexibility, no rupture or cracking (Mandrel Bend Test)	ASTM D 522

Additional Requirements for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test, 730 N/m	ASTM E 736
Fire Resistance, Negligible affect on fire resistance	ASTM E 119

rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	
Impact Resistance, Min. 4.7 N-m (Gardner Impact Test)	ASTM D 2794
Flexibility, no rupture or cracking (Mandrel Bend Test)	ASTM D 522

Additional Requirements for Lockdown Encapsulant

Requirement	Test Standard
Fire Resistance, Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength, 1.5 kN/m (Tests compatibility with cementitious and fibrous fireproofing)	ASTM E 736

2.2 ENCASEMENT PRODUCTS

deleted section

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Asbestos abatement work tasks shall be performed as shown on the detailed plans and drawings, as summarized in paragraph DESCRIPTION OF WORK and including Table 1 and the Contractor's Accident Prevention Plan, Asbestos Hazard Abatement Plan, and the Activity Hazard Analyses. The Contractor shall use the engineering controls and work practices required in 29 CFR 1926, Section .1101(g) in all operations regardless of the levels of exposure. Personnel shall wear and utilize protective clothing and equipment as specified. The Contractor shall not permit eating, smoking, drinking, chewing or applying cosmetics in the regulated area. All hot work (burning, cutting, welding, etc.) shall be conducted under controlled conditions in conformance with 29 CFR 1926, Section .352, Fire Prevention. Personnel of other trades, not engaged in asbestos abatement activities, shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions of the Contractor's Accident Prevention Plan are complied with. Power to the regulated area shall be locked-out and tagged in accordance with 29 CFR 1910, and temporary electrical service with ground fault circuit interrupters shall be provided as needed. Temporary electrical service shall be disconnected when necessary for wet removal. The Contractor shall stop abatement work in the regulated area immediately when the airborne total fiber concentration: (1) equals or exceeds 0.01 f/cc, or the pre-abatement concentration, whichever is greater, outside the regulated area; or (2) equals or exceeds 1.0 f/cc inside the regulated area. The Contractor shall correct the condition to the satisfaction of the Contracting Officer,

including visual inspection and air sampling. Work shall resume only upon notification by the Contracting Officer. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Asbestos abatement shall be performed without damage to or contamination of adjacent work or area. Where such work or area is damaged or contaminated, as verified by the Contracting Officer using visual inspection or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government, as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and air sampling analysis results are obtained and have been evaluated by the Contractor's Designated IH and the Contracting Officer, work shall proceed.

3.3 OBJECTS

3.3.1 Removal of Mobile Objects

Mobile objects, furniture, and equipment will be removed from the area of work by the Government before asbestos abatement work begins. [

3.3.2 Stationary Objects

Stationary objects and furnishings shall be covered with 2 layers of polyethylene and edges sealed with duct tape.

3.3.3 Reinstallation of Mobile Objects

Reinstallation of mobile objects should be minimal as the buildings are slated for demolition. Any objects removed will be for the Contractor’s convenience in performing the abatement.

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Building ventilating systems supplying air into or returning air out of a regulated area shall be shut down and isolated by lockable switch or other positive means in accordance with 29 CFR 1910, Section .147.and isolated by airtight seals to prevent the spread of contamination throughout the system. Air-tight critical barriers shall be installed on building ventilating openings located inside the regulated area that supply or return air from the building ventilation system or serve to exhaust air from the building. The critical barriers shall consist of 2 layers of polyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape. Critical barriers shall be installed as shown on drawings and appended SET-UP DETAIL SHEETS.

3.5 PRECLEANING

No precleaning is anticipated

3.6 METHODS OF COMPLIANCE

3.6.1 Mandated Practices

Asbestos containing materials (caulks/cements) are non-friable and are to be demolished with the building and not removed under this specification. Should any unexpected roofing ACM be encountered, the following shall be used as guidance.

The Contractor shall employ proper handling procedures in accordance with 29 CFR 1926 and 40 CFR 61, Subpart M, and the specified requirements. The specific abatement techniques and items identified shall be detailed in the Contractor's Asbestos Hazard Plan including, but not limited to, details of construction materials, equipment, and handling procedures. The Contractor shall use the following engineering controls and work practices in all operations, regardless of the levels of exposure:

a. Vacuum cleaners equipped with HEPA filters to collect debris and dust containing ACM.

b. Wet methods or wetting agents to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup; except where it can be demonstrated that the use of wet methods is unfeasible due to, for example, the creation of electrical hazards, equipment malfunction, and in roofing.

c. Prompt clean-up and disposal in leak-tight containers of wastes and debris contaminated with asbestos.

d. Inspection and repair of polyethylene in work and high traffic areas.

e. Cleaning of equipment and surfaces of containers filled with ACM prior to removing them from the equipment room or area.

3.6.2 Control Methods

The Contractor shall use the following control methods to comply with the PELs:

a. Local exhaust ventilation equipped with HEPA filter dust collection systems;

b. Enclosure or isolation of processes producing asbestos dust;

c. Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter;

d. Use of other work practices and engineering controls;

e. Where the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the PELs, the Contractor shall use them to reduce employee exposure to the lowest levels attainable by these controls and shall supplement them by the use of respiratory protection that complies with paragraph, RESPIRATORY PROTECTION PROGRAM.

3.6.3 Unacceptable Practices

The following work practices and engineering controls shall not be used for work related to asbestos or for work which disturbs ACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

a. High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

b. Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

c. Dry sweeping, shoveling, or other dry clean-up of dust and debris containing ACM.

d. Employee rotation as a means of reducing employee exposure to asbestos.

3.6.4 Class I Work Procedures

In addition to requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the installation and operation of the control system.

b. For jobs involving the removal of more than 7.5 m or 0.9 square meters of TSI or surfacing material, the Contractor shall place critical barriers over all openings to the regulated area.

c. HVAC systems shall be isolated in the regulated area by sealing with a double layer of plastic or air-tight rigid covers.

d. Impermeable dropcloths (0.15 mm or greater thickness) shall be placed on surfaces beneath all removal activity.

e. Objects within the regulated area shall be handled as specified in paragraph OBJECTS.

f. Where a negative exposure assessment has not been provided or where exposure monitoring shows the PEL was exceeded, the regulated area shall be ventilated to move contaminated air away from the employee's breathing zone toward a HEPA unit or collection device.

3.6.5 Specific Control Methods for Class I Work

In addition to requirements of paragraph Class I Work Procedures, Class I asbestos work shall be performed using the control methods identified in the subparagraphs below.

3.6.5.1 Negative Pressure Enclosure (NPE) System

The NPE system shall provide at least 4 air changes per hour inside the containment. The local exhaust unit equipment shall be operated 24 hours

per day until the containment is removed, and shall be leak-proof to the filter and equipped with HEPA filters. Air movement shall be directed away from the employees and toward a HEPA filtration device. The NPE shall be smoke tested for leaks at the beginning of each shift. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential of minus 0.5 mm of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic manometric recording instrument. Pressure differential recordings shall be provided daily on the same day collected. Readings shall be reviewed by the Contractor's Designated Competent Person and IH prior to submittal. The Contracting Officer shall be notified immediately if the pressure differential falls below the prescribed minimum. The building ventilation system shall not be used as the local exhaust system for the regulated area. The local exhaust system shall terminate outdoors unless an alternate arrangement is allowed by the Contract Officer. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

3.6.5.2 Glovebag Systems

Glovebag systems shall be as shown in SETUP DETAIL SHEET 10. The glovebag system shall be used to remove ACM from straight runs of piping and elbows and other connections. Glovebags shall be used without modification and shall be smoke-tested for leaks and any leaks sealed prior to use. Glovebags shall be installed to completely cover the circumference of pipe or other structures where the work is to be done. Glovebags shall be used only once and shall not be moved. Glovebags shall not be used on surfaces that have temperatures exceeding 66 degrees C. Prior to disposal, glovebags shall be collapsed by removing air within them using a HEPA vacuum. Before beginning the operation, loose and friable material adjacent to the glovebag operation shall be wrapped and sealed in 2 layers of plastic or otherwise rendered intact. At least 2 persons shall perform Class I glovebag removal. Asbestos regulated work areas shall be established as specified and shown on detailed drawings and plans for glovebag abatement. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained, including area signage and boundary warning tape as specified in SET-UP DETAIL SHEET 11.

a. In addition to requirements for negative pressure glovebag systems above, the Contractor shall attach HEPA vacuum systems or other devices to the bag to prevent collapse during removal of ACM from straight runs of piping and elbows and other connections.

b. The negative pressure glove boxes used to remove ACM from pipe runs shall be fitted with gloved apertures and a bagging outlet and constructed with rigid sides from metal or other material which can withstand the weight of the ACM and water used during removal. A negative pressure shall be created in the system using a HEPA filtration system. The box shall be smoke tested for leaks prior to each use.

3.6.5.3 Mini-Enclosures

Single bulkhead containment or Mini-containment (small walk-in enclosure)] as shown in SETUP DETAIL SHEET 6 and 7 to accommodate no more than 2 persons, may be used if the disturbance or removal can be completely

contained by the enclosure with the following specifications and work practices. The mini-enclosure shall be inspected for leaks and smoke tested before each use. Air movement shall be directed away from the employee's breathing zone within the mini-enclosure.

3.6.5.4 Wrap and Cut Operation

No TSI piping is in this phase of the project.

3.6.6 Class II Work

In addition to the requirements of paragraphs Mandated Practices and Control Methods, the following engineering controls and work practices shall be used:

a. A Competent Person shall supervise the work.

b. For indoor work, critical barriers shall be placed over all openings to the regulated area.

c. Impermeable dropcloths shall be placed on surfaces beneath all removal activity.

3.6.7 Specific Control Methods for Class II Work

In addition to requirements of paragraph Class II Work, Class II work shall be performed using the following methods:

3.6.7.1 Vinyl and Asphalt Flooring Materials

Resilient vinyl and asphalt flooring materials shall be removed by adequately wet methods. Tiles shall be removed intact (if possible); wetting is not required when tiles are heated and removed intact. Flooring or its backing shall not be sanded. Scraping of residual adhesive and/or backing shall be performed using wet methods. Mechanical chipping is prohibited unless performed in a negative pressure enclosure. Dry sweeping is prohibited. The Contractor shall use vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) to clean floors.

3.6.7.2 Roofing Material

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Roofing Materials are to be abated under this phase of work if the building debris is placed in the installation's Lamont Landfill. For off-installation disposal of building debris including ACM roofing caulks and cements will be wetted and demolished with the building. ~~No Roofing Materials are to be abated under ths phase of work. All roofing caulks and cements will be wetted and demolished with the building.~~ Should unexpected asbestos containing roofing materials be encountered the paragraph below shall be followed.

When removing roofing materials which contain ACM as described in 29 CFR 1926, Section .1101(g)(8)(ii), the Contractor shall use the following practices as shown in RESPONSE ACTION DETAIL SHEETS 74 and/or 75. Roofing material shall be removed in an intact state. Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not

intact during removal, unless such wet methods are not feasible or will create safety hazards. When removing built-up roofs, with asbestos-containing roofing felts and an aggregate surface, using a power roof cutter, all dust resulting from the cutting operations shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line. Asbestos-containing roofing material shall not be dropped or thrown to the ground, but shall be lowered to the ground via covered, dust-tight chute, crane, hoist or other method approved by the Contracting Officer. Any ACM that is not intact shall be lowered to the ground as soon as practicable, but not later than the end of the work shift. While the material remains on the roof it shall be kept wet or placed in an impermeable waste bag or wrapped in plastic sheeting. Intact ACM shall be lowered to the ground as soon as practicable, but not later than the end of the work shift. Unwrapped material shall be transferred to a closed receptacle precluding the dispersion of dust. Critical barriers shall be placed over roof level heating and ventilation air intakes.

3.6.7.3 Cementitious Siding and Shingles or Transite Panels

When removing cementitious asbestos-containing siding, shingles or transite panels the Contractor shall use the following practices shown in RESPONSE ACTION DETAIL SHEET 81 or 83, which ever is most appropriate to removing the boiler room transite.. Intentionally cutting, abrading or breaking siding, shingles, or transite panels is prohibited. Each panel or shingle shall be sprayed with amended water prior to removal. Nails shall be cut with flat, sharp instruments. Unwrapped or unbagged panels or shingles shall be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.

3.6.7.4 Gaskets

Gaskets shall be thoroughly wetted with amended water prior to removal and immediately placed in a disposal container. If a gasket is visibly deteriorated and unlikely to be removed intact, removal shall be undertaken within a glovebag. Any scraping to remove residue shall be performed wet.

3.6.7.5 Other Class II Jobs

The Contractor shall use the following work practices when performing Class II removal of ACM: The material shall be thoroughly wetted with amended water prior and during its removal. The material shall be removed in an intact state. Cutting, abrading or breaking the material is prohibited. The ACM removed shall be immediately bagged or wrapped.

3.6.8 Specific Control Methods for Class III Work

No Class III is anticipated.

3.6.9 Specific Control Methods for Class IV Work

Class IV jobs shall be conducted using wet methods, HEPA vacuums, and prompt clean-up of debris containing ACM. Employees cleaning up debris and waste in a regulated area where respirators are required shall wear the selected respirators.

3.6.10 Alternative Methods for Roofing Materials and Asphaltic Wrap

It has been determined that the roofing cement can be safely demolished with the building. Should unexpected ACM roofing materials be encountered, which must be removed prior to demolition, the following requirements shall be followed.

The Contractor shall use the following engineering controls and work practices when removing, repairing, or maintaining intact pipeline asphaltic wrap, or roof cements, mastics, coatings, or flashings which contain asbestos fibers encapsulated or coated by bituminous or resinous compounds. If during the course of the job the material does not remain intact, the Contractor shall use the procedures described in paragraph Roofing Material. Before work begins, and as needed during the job, the Designated Competent Person shall conduct an inspection and determine that the roofing material is intact and will likely remain intact. The material shall not be sanded, abraded, or ground. Manual methods which would render the material non-intact shall not be used. Roofing material shall not be dropped or thrown to the ground but shall be lowered via covered, dust-tight chute, crane, hoist or other method approved by the Contracting Officer. All such material shall be removed from the roof as soon as practicable, but not later than the end of the work shift. Removal or disturbance of pipeline asphaltic wrap shall be performed using wet methods.

3.6.11 Cleaning After Asbestos Removal

After completion of all asbestos removal work, surfaces from which ACM has been removed shall be wet wiped or sponged clean, or cleaned by some equivalent method to remove all visible residue. Run-off water shall be collected and filtered through a dual filtration system. A first filter shall be provided to remove fibers 20 micrometers and larger, and a final filter provided that removes fibers 5 micrometers and larger. After the gross amounts of asbestos have been removed from every surface, remaining visible accumulations of asbestos on floors shall be collected using plastic shovels, rubber squeegees, rubber dustpans, and HEPA vacuum cleaners as appropriate to maintain the integrity of the regulated area. When TSI and surfacing material has been removed, workmen shall use HEPA vacuum cleaners to vacuum every surface. Surfaces or locations which could harbor accumulations or residual asbestos dust shall be checked after vacuuming to verify that no asbestos-containing material remains; and shall be re-vacuumed as necessary to remove the ACM.

3.6.12 Class I Asbestos Work Response Action Detail Sheets

No Class I Asbestos work is anticipated for this project.

3.6.13 Class II Asbestos Work Response Action Detail Sheets

The following Class II Asbestos Work Response Action Detail Sheet are recommended for use. Contractor’s Designer shall specify these and other appropriate sheet swhen developing Table 1:

a. Vinyl or Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos-Containing Adhesive: See Sheet 56

b. Vinyl Asbestos Tile and Chemical Dissolution of Asbestos-Containing Adhesives on Concrete Floor System: See Sheet 59

c. Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos-Containing Adhesive: See Sheet 61

d. Miscellaneous Asbestos-Containing Materials: See Sheet 45

e. Asbestos Cement Siding: See Sheet 81

3.6.14 Abatement of Asbestos Contaminated Soil

No asbestos contaminated soil is expected on this project. Should the Contractor accidentally contaminate soil, it shall be cleaned in accordance with the following requirements.

Asbestos contaminated soil shall be removed from areas to a minimum depth of 50 mm. Soil shall be thoroughly dampened with amended water and then removed by manual shoveling into labeled containers. The workers shall be closely monitored for heat exhaustion. Large quantities shall be vacuumed by truck or jand-vacuum.

3.6.15 Enclosure of ACM

No ACM enclosure is required for this project as all buildings are to be demolished.

3.6.16 Encapsulation of ACM

Prior to applying any encapsulant, the entire surface area shall be inspected for loose, or damaged asbestos material:

a. Penetrating Encapsulation: Before penetrating encapsulation is applied, asbestos removal work in the area shall be complete and the surfaces to be encapsulated shall be free of loose or damaged material. Substrate shall be evaluated before application to ensure that the encapsulant will not cause the substrate to fail in any way. Acoustical wall and ceiling plaster surfaces shall be encapsulated in accordance with manufacturer's recommendations. Plug samples shall be taken to determine if full penetration has been achieved. If full penetration has not been achieved, surfaces shall be recoated while the matrix is still wet, until full penetration is achieved: See Detail Sheet 39.

b. Bridging Encapsulation: Prior to applying the bridging encapsulant, the pre-encapsulation inspection shall be performed. The surface shall be encapsulated in sections of 93 square meters or less as recommended by the encapsulant manufacturer. Upon completion of each section, the dry thickness of the bridging encapsulation shall be measured. Additional bridging encapsulant shall be applied to obtain the desired encapsulant thickness. Additional coats shall blend with the original bridging encapsulant. Bridging encapsulation shall include:
Asbestos Cement Wall, Fiberboard and Drywall Panels: See Detail Sheet 49

3.6.17 Combination Encapsulation of Acoustical Wall and Ceiling Plaster

No abatement of ACM acoustical walls or ceilings are in this project

3.6.18 Response Action Detail Sheets for Repair of Class I Materials

Not applicable to this project.

3.6.19 Response Action Detail Sheets for Repair of Class II Materials

a. Vinyl or Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos-Containing Adhesive: See Detail Sheet 56

b. Vinyl or Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Containing Adhesive: See Detail Sheet 60.

3.6.20 Encasement of ACM

Not applicable to this job.

3.6.21 Sealing Contaminated Items Designated for Disposal

Not applicable to this project.

3.7 FINAL CLEANING AND VISUAL INSPECTION

Upon completion of abatement, the regulated area shall be cleaned by collecting, packing, and storing all gross contamination; see SET-UP DETAIL SHEETS 9, 14 and 20. A final cleaning shall be performed using HEPA vacuum and wet cleaning of all exposed surfaces and objects in the regulated area. Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection before final air clearance monitoring and recleaning, as necessary. Upon completion of the final cleaning, the Contractor and the Contracting Officer shall conduct a final visual inspection of the cleaned regulated area in accordance with ASTM E 1368 and document the results on the Final Cleaning and Visual Inspection as specified on the SET-UP DETAIL SHEET 19. If the Contracting Officer rejects the clean regulated area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Contracting Officer. Recleaning and follow-up reinspection shall be at the Contractor's expense.

3.8 LOCKDOWN

Prior to removal of plastic barriers and after clean-up of gross contamination and final visual inspection, a post removal (lockdown) encapsulant shall be spray applied to ceiling, walls, floors, and other surfaces in the regulated area.

3.9 EXPOSURE ASSESSMENT AND AIR MONITORING

3.9.1 General Requirements For Exposure

Exposure assessment, air monitoring and analysis of airborne concentration of asbestos fibers shall be performed in accordance with 29 CFR 1926, Section .1101, the Contractor's air monitoring plan, and as specified. Personal exposure air monitoring (collected at the breathing zone) that is representative of the exposure of each employee who is assigned to work within a regulated area shall be performed by the Contractor's Designated

IH. Breathing zone samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of 2, whichever is greater. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section. The Contractor shall provide an onsite independent testing laboratory with qualified analysts and appropriate equipment to conduct sample analyses of air samples using the methods prescribed in 29 CFR 1926, Section .1101, to include NIOSH Pub No. 84-100 Method 7400. Preabatement and abatement environmental air monitoring shall be performed by the Contractor's Designated IH which may be monitored by the Contracting Officer's IH. Final clearance environmental air monitoring, shall be performed by the Contractor's Designated IH. Environmental and final clearance air monitoring shall be performed using NIOSH Pub No. 84-100 Method 7400 (PCM) with optional confirmation of results by NIOSH Pub No. 84-100 Method 7402 the EPA TEM Method specified in 40 CFR 763. For environmental and final clearance, air monitoring shall be conducted at a sufficient velocity and duration to establish the limit of detection of the method used at 0.005 f/cc. Confirmation of asbestos fiber concentrations (asbestos f/cc) from environmental and final clearance samples collected and analyzed by NIOSH Pub No. 84-100 Method 7400 (total f/cc) may be conducted using TEM in accordance with NIOSH Pub No. 84-100 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH Pub No. 84-100 Method 7400 PCM analysis. For all Contractor required environmental or final clearance air monitoring, confirmation of asbestos fiber concentrations, using NIOSH Pub No. 84-100 Method 7402, shall be at the Contractor's expense. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. Results of breathing zone samples shall be posted at the job site and made available to the Contracting Officer. The Contractor shall maintain a fiber concentration inside a regulated area less than or equal to 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the Contracting Officer to determine the cause. At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as averaged over a sampling period of 30 minutes. Should either an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside a regulated work area, the Contractor shall stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the Contracting Officer.

3.9.2 Initial Exposure Assessment

The Contractor 's Designated IH shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the

Contractor which indicate the levels of airborne asbestos likely to be encountered on the job.

3.9.3 Initial and Negative Exposure Assessment

The Contractor shall ensure that all Initial Exposure Assessments and Negative Exposure Assessments meet or exceed the OSHA standard, particularly *1926.1101(f)(2)(iii)(A)(B)* Negative Exposure Assessment: For any one specific asbestos job which will be performed by employees who have been trained in compliance with the standard, the employer must demonstrate that employee exposures will be below the PELs by data which conform to the following criteria;

The Contractor shall provide a negative exposure assessment for the specific asbestos job which will be performed. The negative exposure assessment shall be provided within 30 days of the initiation of the project and conform to the following criteria:

a. Objective Data: Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the PEL-TWA and PEL-Excursion Limit under those work conditions having the greatest potential for releasing asbestos.

b. Prior Asbestos Jobs: Where the Contractor has monitored prior asbestos jobs for the PEL and the PEL-Excursion Limit within 6 months of the current job, the monitoring and analysis were performed in compliance with asbestos standard in effect; the data were obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations; the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job; and these data show that under the conditions prevailing and which will prevail in the current workplace, there is a high degree of certainty that the monitoring covered exposure from employee exposures will not exceed the PEL-TWA and PEL-Excursion Limit.

c. Initial Exposure Monitoring: The results of initial exposure monitoring of the current job, made from breathing zone air samples that are representative of the 8-hour PEL-TWA and 30-minute short-term exposures of each employee. The monitoring covered exposure from operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

3.9.4 Independent Environmental Monitoring

The prime Contractor shall retained an independent air monitoring firm to perform pre-abatement and during abatement and final clearance air monitoring. The air monitoring contractor has been provided a copy of the contract that includes this abatement work. The abatement contractor will provide the air monitoring contractor with an up-to-date copy of the accepted Asbestos Hazard Abatement Plan, Accident Prevention Plan and pertinent detailed drawings. The air monitoring contractor is required to comply with the abatement contractor's safety and health requirements. The

abatement contractor will coordinate all onsite activities with the air monitoring contractor, the COR, and other affected parties as directed by the COR. The abatement contractor will provide the air monitoring contractor with an up-to-date schedule of abatement contractor work activities. The air monitoring contractor will coordinate with the abatement contractor and the COR during the performance Government required air monitoring. The abatement contractor is responsible for performing exposure assessment and personal air monitoring of abatement contractor's work. The air monitoring contractor is responsible for performing these tasks for its employee.

3.9.5 Preabatement Environmental Air Monitoring

Preabatement environmental air monitoring shall be established 1 day prior to the masking and sealing operations for each regulated area to determine background concentrations before abatement work begins. As a minimum, preabatement air samples shall be collected using NIOSH Pub No. 84-100 Method 7400, PCM at these locations: outside the building; inside the building, but outside the regulated area perimeter; and inside each regulated work area. One sample shall be collected for every 185 square meters of floor space. At least 2 samples shall be collected outside the building: at the exhaust of the HEPA unit; and downwind from the abatement site. The PCM samples shall be analyzed within 24 hours; and if any result in fiber concentration greater than 0.01 f/cc, asbestos fiber concentration shall be confirmed using NIOSH Pub No. 84-100 Method 7402 (TEM).

3.9.6 Environmental Air Monitoring During Abatement

Until an exposure assessment is provided to the Contracting Officer, environmental air monitoring shall be conducted at locations and frequencies that will accurately characterize any evolving airborne asbestos fiber concentrations. The assessment shall demonstrate that the product or material containing asbestos minerals, or the abatement involving such product or material, cannot release airborne asbestos fibers in concentrations exceeding 0.01 f/cc as a TWA under those work conditions having the greatest potential for releasing asbestos. The monitoring shall be at least once per shift at locations including, but not limited to, close to the work inside a regulated area; preabatement sampling locations; outside entrances to a regulated area; close to glovebag operations; representative locations outside of the perimeter of a regulated area; inside clean room; and at the exhaust discharge point of local exhaust system ducted to the outside of a containment (if used).> If the sampling outside regulated area shows airborne fiber levels have exceeded background or .01 f/cc, whichever is greater, work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the Contracting Officer.

3.9.7 Final Clearance Air Monitoring

Prior to conducting final clearance air monitoring, the Contractor and the Contracting Officer shall conduct a final visual inspection of the regulated area where asbestos abatement has been completed. The final visual inspection shall be as specified in SET-UP DETAIL SHEET 19. Final clearance air monitoring shall not begin until acceptance of the Contractor's final cleaning by the Contracting Officer. The Contractor's Designated IH shall conduct final clearance air monitoring using aggressive air sampling

techniques as defined in EPA 560/5-85-024 or as otherwise required by federal or state requirements. The results shall be reviewed by the prime Contractor's CIH. The sampling and analytical method used will be NIOSH Pub No. 84-100 Method 7400 (PCM) and Table

3.9.7.1 Final Clearance Requirements, NIOSH PCM Method

For PCM sampling and analysis using NIOSH Pub No. 84-100 Method 7400, the fiber concentration inside the abated regulated area, for each airborne sample, shall be less than 0.01 f/cc. The abatement inside the regulated area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.01 total f/cc, the asbestos fiber concentration (asbestos f/cc) shall be confirmed from that same filter using NIOSH Pub No. 84-100 Method 7402 (TEM) at Contractor's expense. If any confirmation sample result is greater than 0.01 asbestos f/cc, abatement is incomplete and cleaning shall be repeated. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria shall be done.

3.9.7.2 Final Clearance Requirements, EPA TEM Method

For EPA TEM sampling and analysis, using the EPA Method specified in 40 CFR 763, abatement inside the regulated area is considered complete when the arithmetic mean asbestos concentration of the 5 inside samples is less than or equal to 70 structures per square millimeter (70 S/mm). When the arithmetic mean is greater than 70 S/mm, the 3 blank samples shall be analyzed. If the 3 blank samples are greater than 70 S/mm, resampling shall be done. If less than 70 S/mm, the 5 outside samples shall be analyzed and a Z-test analysis performed. When the Z-test results are less than 1.65, the decontamination shall be considered complete. If the Z-test results are more than 1.65, the abatement is incomplete and cleaning shall be repeated. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria shall be done.

3.9.7.3 Air Clearance Failure

If clearance sampling results fail to meet the final clearance requirements, the Contractor shall pay all costs associated with the required recleaning, resampling, and analysis, until final clearance requirements are met.

3.9.8 Air-Monitoring Results and Documentation

Air sample fiber counting shall be completed and results provided within 24 hours (breathing zone samples), and 24 hours (environmental/clearance monitoring) after completion of a sampling period. The Contracting Officer shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal and the Contractor's Designated IH]. The air sampling results shall be documented on a Contractor's daily air monitoring log. The air monitoring log shall contain the following information for each sample:

a. Sampling and analytical method used;

b. Date sample collected;

c. Sample number;

d. Sample type: BZ = Breathing Zone (Personal), PA = Preabatement, E = Environmental, AC = Abatement Clearance;</TAI>

e. Location/activity/name where sample collected;

f. Sampling pump manufacturer, model and serial number, beginning flow rate, end flow rate, average flow rate (L/min);

g. Calibration date, time, method, location, name of calibrator, signature;

h. Sample period (start time, stop time, elapsed time (minutes);

i. Total air volume sampled (liters);

j. Sample results (f/cc and S/mm square) if EPA methods are required for final clearance;

k. Laboratory name, location, analytical method, analyst, confidence level. In addition, the printed name and a signature and date block for the Industrial Hygienist who conducted the sampling and for the Industrial Hygienist who reviewed the daily air monitoring log verifying the accuracy of the information.

3.10 CLEARANCE CERTIFICATION

When asbestos abatement is complete, ACM waste is removed from the regulated areas, and final clean-up is completed, the Contracting Officer will certify the areas as safe before allowing the warning signs and boundary warning tape to be removed. The Contractor and the Contracting Officer shall visually inspect all surfaces within the containment for residual material or accumulated debris. The Contractor shall reclean all areas showing dust or residual materials. The Contracting Officer will certify in writing that the area is safe before unrestricted entry is permitted. The Government will have the option to perform monitoring to certify the areas are safe before entry is permitted.

3.11 CLEANUP AND DISPOSAL

3.11.1 Title to ACM Materials

ACM material resulting from abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified and in accordance with applicable federal, state and local regulations.

3.11.2 Collection and Disposal of Asbestos

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All ACM waste shall be collected and including contaminated wastewater filters, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing, shall be collected and placed in leak-tight containers such as double plastic bags (see DETAIL SHEET 9A); sealed double wrapped polyethylene sheet (see DETAIL 9B); sealed fiberboard boxes (see DETAIL SHEET 9C); or other approved containers. Waste within the containers shall be wetted in case the container is breached. Asbestos-containing

waste ~~shall~~ may be disposed of at an EPA, state and local approved asbestos landfill ~~off~~on-post. For temporary storage, sealed impermeable containers shall be stored in an asbestos waste load-out unit or in a storage/transportation conveyance (i.e., dumpster, roll-off waste boxes, etc.) in a manner acceptable to and in an area assigned by the Contracting Officer. Procedure for hauling and disposal shall comply with 40 CFR 61, Subpart M, state, regional, and local standards.

3.11.3 Scale Weight Measurement

Scales used for measurement shall be public scales. Weighing shall be at a point nearest the work at which a public scale is available. Scales shall be standard truck scales of the beam type; scales shall be equipped with the type registering beam and an "over and under" indicator; and shall be capable of accommodating the entire vehicle. Scales shall be tested, approved and sealed by an inspector of the State of North Carolina. Scales shall be calibrated and resealed as often as necessary and at least once every three months to ensure continuous accuracy. Vehicles used for hauling ACM shall be weighed empty daily at such time as directed and each vehicle shall bear a plainly legible identification mark.

3.11.4 Weigh Bill and Delivery Tickets

Copies of weigh bills and delivery tickets shall be submitted to the Contracting Officer during the progress of the work. The Contractor shall furnish the Contracting Officer scale tickets for each load of ACM weighed and certified. These tickets shall include tare weight; identification mark for each vehicle weighed; and date, time and location of loading and unloading. Tickets shall be furnished at the point and time individual trucks arrive at the worksite. A master log of all vehicle loading shall be furnished for each day of loading operations. Before the final statement is allowed, the Contractor shall file with the Contracting Officer certified weigh bills and/or certified tickets and manifests of all ACM actually disposed by the Contractor for this contract. No bulking of asbestos materials (i.e. shipping to an intermediary storage facility until final landfill disposal) shall be allowed.

3.11.5 Asbestos Waste Shipment Record

The Contractor shall complete and provide the Contracting Officer final completed copies of the Waste Shipment Record for all shipments of waste material as specified in 40 CFR 61, Subpart M and other required state waste manifest shipment records, within 3 days of delivery to the landfill. Each Waste Shipment Record shall be signed and dated by the Contractor, the waste transporter and disposal facility operator.

TABLE 1

INDIVIDUAL WORK TASK DATA ELEMENTS

Sheet_____ of _____

There is a separate data sheet for each individual work task.

1. WORK TASK DESIGNATION NUMBER _____
2. LOCATION OF WORK TASK_____
   _____
3. BRIEF DESCRIPTION OF MATERIAL TO BE ABATED:_____
   _____

   a. Type of Asbestos _____
   b. Percent asbestos content _____%

4. ABATEMENT TECHNIQUE TO BE USED_____
5. OSHA ASBESTOS CLASS DESIGNATION FOR WORK TASK_____
6. EPA NESHAP FRIABILITY DESIGNATION FOR WORK TASK
   Friable _____ Non-friable Category I _____
   Non-friable Category II_____
7. FORM _____ and CONDITION OF ACM: GOOD_____ FAIR_____ POOR_____
8. QUANTITY: METERS_____, SQUARE METERS_____
8a. QUANTITY: LINEAR FT._____, SQUARE FT._____
9. RESPONSE ACTION DETAIL SHEET NUMBER FOR WORK TASK_____
10. SET-UP DETAIL SHEET NUMBERS
    FOR WORK TASK _____, _____, _____, _____,
    _____, _____, _____, _____.

NOTES:

(1) Numeric sequence of individual work tasks (1,2,3,4, etc.) for each regulated area. Each category of EPA friability/OSHA class has a separate task.

(2) Specific location of work (building, floor, area, e.g., Building 1421, 2nd Floor, Rm 201)

(3) A description of material to be abated (example: horizontal pipe, cement wall panels, tile, stucco, etc.) type of asbestos (chrysotile, amosite, crocidolite, etc.); and % asbestos content.

(4) Technique to be used: Removal = REM; Encapsulation = ENCAP; Encasement = ENCAS; Enclosure = ENCL; Repair = REP.

(5) Class designation: Class I, II, III, or IV (OSHA designation).

(6) Friability of materials: Check the applicable EPA NESHAP friability designation.

(7) Form: Interior or Exterior Architectural = IA or EA; Mechanical/Electrical = ME.
Condition: Good = G; Fair = F; Poor = P.

(8) Quantity of ACM for each work task in meters or square meters.

(8a) Quantity of ACM for each work task in linear feet or square feet.

(9) Response Action Detail Sheet specifies the material to be abated and the methods to be used. There is only one Response Action Detail Sheet for each abatement task.

(10) Set-up Detail Sheets indicate containment and control methods used in support of the response action (referenced in the selected Response Action Detail Sheet).

TABLE 2

FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL
(Reference: NIOSH 7400)

Fibers/cc(01.95 percent CL) = X + [(X) * (1.645) * (CV)]

Where: X = ((E)(AC))/((V)(1000))

E = ((F/Nf) - (B/Nb))/Af

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

AC = Effective collection area of the filter in square millimeters

V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter

F/Nf = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

Af = Graticule field area in square millimeters

TWA = C1/T1 + C2/T2 = Cn/Tn

Where: C = Concentration of contaminant

T = Time sampled.

<TAI OPT=CLASS II REMOVAL>
TABLE 3

NI0SH METHOD 7400

PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol. (Note 2) (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	0.5/140 Square Meters (Notes 3 & 4)	0.45 microns	3850	2-16
Each Room in 1 Abatement Area Less than 140 Square meters		0.45 microns	3850	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.

2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.

3. One sample shall be added for each additional 140 square meters. (The corresponding I-P units are 5/1500 square feet).

4. A minimum of 5 samples are to be taken per abatement area, plus 2 field blanks.

</TAI>

<TAI OPT=CLASS II REMOVAL>
TABLE 4

EPA AHERA METHOD: TEM AIR SAMPLING PROTOCOL

Location Sampled	Minimum No. of Samples	Filter Pore Size	Min. Vol. (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	5	0.45 microns	1500	2-16
Outside Abatement Area	5	0.45 microns	1500	2-16
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:

1. Type of filter is Mixed Cellulose Ester.

2. The detection limit for TEM analysis is 70 structures/square mm.

</TAI>

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____
PROJECT ADDRESS _____
CONTRACTOR FIRM NAME _____
EMPLOYEE'S NAME _____,_____,_____,
(Print) (Last) (First) (MI)

Social Security Number: _____-_____-_____,

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that you be provided and you complete formal asbestos training specific to the type of work you will perform and project specific training; that you be supplied with proper personal protective equipment including a respirator, that you be trained in its use; and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you. The Contractor's Designated Industrial Hygienist will check the block(s) for the type of formal training you have completed. Review the checked blocks prior to signing this certification.

FORMAL TRAINING:
_____ a. For Competent Persons and Supervisors: I have completed EPA's Model Accreditation Program (MAP) training course, "Contractor/Supervisor", that meets this State's requirements.

b. For Workers:
_____ (1) For OSHA Class I work: I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (2) For OSHA Class II work (where there will be abatement of more than one type of Class II materials, i.e., roofing, siding, floor tile, etc.): I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
(3) For OSHA Class II work (there will only be abatement of one type of Class II material):
_____ (a) I have completed an 8-hour training class on the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls of 29 CFR 1926, Section .1101(g) and hands-on training.
_____ (b) I have completed EPA's MAP training course, "Worker", that meets this State's requirements.
_____ (4) For OSHA Class III work: I have completed at least a 16-hour course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, Section .92(a)(2) and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101, and hands-on training.

_____ (5) For OSHA Class IV work: I have completed at least a 2-hr course consistent with EPA requirements for training of local education agency maintenance and custodial staff at 40 CFR 763, (a)(1), and the elements of 29 CFR 1926, Section .1101(k)(9)(viii), in addition to the specific work practices and engineering controls at 29 CFR 1926, Section .1101(g) and hands-on training.

_____ c. Workers, Supervisors and the Designated Competent Person: I have completed annual refresher training as required by EPA's MAP that meets this State's requirements.

PROJECT SPECIFIC TRAINING:
_____ I have been provided and have completed the project specific training required by this Contract. My employer's Designated Industrial Hygienist and Designated Competent Person conducted the training.

RESPIRATORY PROTECTION:
_____ I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair and contact lens use policy of my employer.

RESPIRATOR FIT-TEST TRAINING:
_____ I have been trained in the proper selection, fit, use, care, cleaning, maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time.

MEDICAL EXAMINATION:
_____ I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made a determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's Industrial Hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

_____ were no limitations to performing the required work tasks.
_____ were identified physical limitations to performing the required work tasks.

Date of the medical examination _____

Employee Signature _____ date _____
Contractor's Industrial
Hygienist Signature _____ date _____