City of Memphis

Design Directive
for the Built Environment

Rev.

contents

Introduction

- Introduction 03
- How To Use This Directive 04
- Applicability Matrix 05
- Scoring Matrix 06

Design Principles

- 01 Integration 10
- 02 Equitable Communities 12
- 03 Ecosystems 14
- 04 Water 16
- 05 Economy 18
- 06 Energy 20
- 07 Well-being 22
- 08 Resources 24
- 09 Change 26
- 10 Discovery 28

Division Standards

- 11 Consultant Responsibilities 32
- 12 Administrative Specifications 38
- 13 Material Specifications 44
- 14 Fire Department 60
- 15 General Services 62
- 16 Public Libraries 64
- 17 Police Department 66
- 18 Parks 68
- 19 Public Works 70
- 20 Solid Waste 72

Resources

- Abbreviations / Definitions 76
- Capital Budget 77
- Index of Images 78
- Contributors 79
- Index of Revisions 80

introduction

The City of Memphis is committed to providing sustainable, forward-thinking design of buildings and environments for the Memphis community. The future health and well-being of the population of Memphis is directly related to the spaces we inhabit and experience daily, and the long-term effects on our environment are directly impacted by the buildings and spaces we design and construct.

This Design Directive is a set of 10 defining principles for designers to follow in order to provide a healthy and sustainable future for the City of Memphis. Based upon the American Institute of Architects (AIA) Framework for Design Excellence, this Design Directive is a regional-specific guide to inform designers with options to progress toward a zero-carbon, equitable, resilient, and healthy built environment, regardless of size, typology, or aspiration.

The AIA Framework for Design Excellence is a tool developed from the AIA Committee on the Environment's (COTE) progressive knowledge community of sustainability and environmental stewardship leaders, which has been advancing sustainability within the architecture, engineering, construction, and design community for more than 30 years. Building upon this expertise and unwavering conviction, the Framework for Design Excellence has become the unequivocal evaluation standard for the built environment that not only promotes aesthetics, but meaningful performance across all measures of design success at the highest level. The 10 principles of the Framework are design for: Integration, Equitable Communities, Ecosystems, Water, Economy, Energy, Wellbeing, Resources, Change, and Discovery, and consist of a series of searching questions which guide more than prescribe. The 10 principles are defined in each section of this Design Directive.

This Design Directive also includes standards and requirements of the City of Memphis and its divisions that build, renovate, or alter the built environment. This Design Directive is part of, and subordinate to the Contract between the City of Memphis and each Consultant. The current version of this Design Directive is provided to the Consultant with each contract awarded. The version distributed with the Contract is to be applied throughout the duration of the Contract and the respective Project.

By following the guidance of this Design Directive, the design process will add social, economic, and environmental value to the City of Memphis built environment for the future of our community.

how to use the design directive

The Design Directive includes 2 major sections: 10 Design Principles and Division Standards.

The 10 Design Principles are the core ideas which inform designers of options for creating a better built environment. Each Design Principle includes 5 Action Items to be incorporated into each project. Suggested schedules for Action Items are included herein.

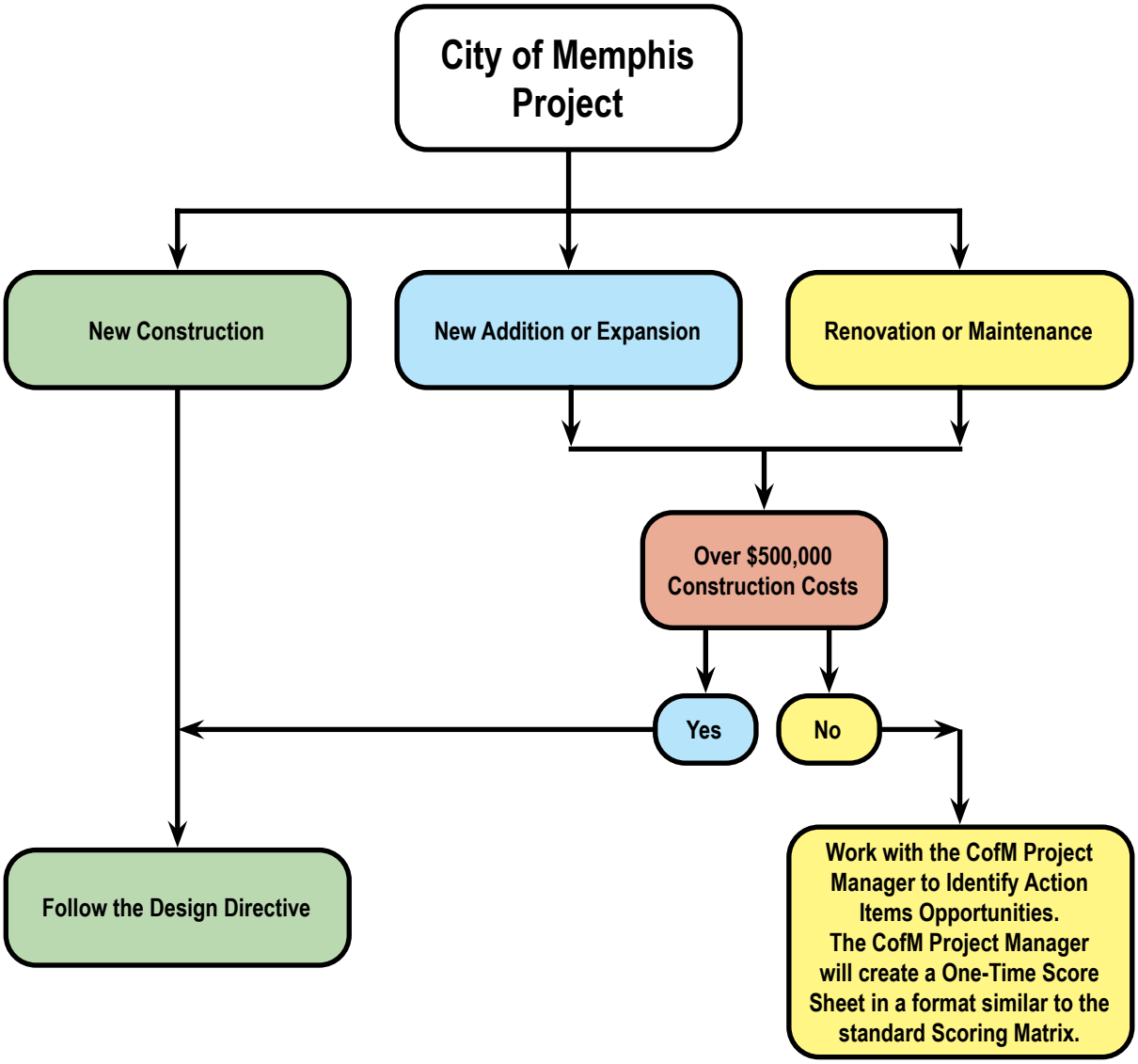
Division Standards are the specifications required in each project. Division Standards include sections for all projects and sections specific to individual City Divisions.

Suggested procedure:

1. Review the Applicability Matrix (adjacent page) with the CofM Project Manager to determine proper project approach.
2. Read the forward for each of the 10 Design Principles for the concept drivers and baseline questions of each Principle.
3. Identify how the project can address each of the 5 Action Items under each Design Principle. Note Action Items are minimums, and additional higher-value items may be added upon discussion with the CofM Project Manager.
4. Begin the Scoring Matrix for the items above and discuss intended direction with the CofM Project Manager. An example of the Scoring Matrix is on the next page.
5. Complete the Matrix for each phase as the project advances and review the Matrix with the CofM Project Manager as a component of each phase deliverable.
6. Compliance is achieved via an 80% or higher score on the Scoring Matrix. Items identified as N/A will not count against compliance.
7. Refer to the Division Standards and identify which section the project must adhere to. Follow the direction in the appropriate Division Standards.
8. All Consultants and Projects must adhere to the Consultant Responsibilities, Administrative Specifications, and Material Specifications Sections.

applicability matrix

Upon beginning each project, the consultant shall review the Applicability Matrix with the CofM Project Manager to determine proper project approach. Some projects, or components of projects, will not meet the intent of the Design Directive or every Design Principle within the Design Directive. The CofM Project Manager will determine the intent and project approach the consultant must adhere to.



scoring matrix

Use the Scoring Matrix to track the Action Items of a Project from Pre Design through Completion. The image below is a representation of a blank Excel .XLSX document that Consultants shall obtain from the CofM Project Manager and keep updated throughout the life of the Project.

scoring matrix

project:
project address:

City CIP No:
BD&C Project No:
Designer Project No:
Construction Contract No:
Construction Contract Date:

Verify Contractor Compliance | Final Project Recapitulation

Color Legend

Projected	Items projected to be incorporated into the project, but not yet verified.
Selected	Items presently selected to be incorporated into the project.
Achieved	Items verified as completed within the project.
Rejected	Items capable, but not incorporated into the project.
N/A	Items not applicable to the project, and do not count against % successful.

Design Principle	#	Action item	PD		SD		DD		CD		BN		CA	PO		Notes
			Action	Credit	Action	Credit	Action	Credit	Action	Credit	Action	Credit		Action	Credit	
01 INTEGRATION	1.01	Conduct a Visioning Charrette	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	1.02	Establish Project Goals	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	1.03	Promote an Integrated Design Process	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	1.04	Sustainable Design Consultant or Champion	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	1.05	Multi-Tasking Design Strategies	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
02 EQUITABLE COMMUNITIES	2.01	Development a Plan for Robust Stakeholder Engagement	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	2.02	Evaluation of Demographics, Transportation, Socio-Economic, Landscape of Surrounding Area	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	2.03	Enhance Public Infrastructure Connections on Project Site	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	2.04	Provide Open Public Space for Community Uses	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	2.05	Accomodation for Diverse Needs	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
03 ECOSYSTEMS	3.01	Reduce Heat Island Effect	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	3.02	Native Plant Species & Pollinator Gardens	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	3.03	Preserve Dark Skies	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	3.04	Surrounding Site Analysis	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	3.05	Conserve Native Habitats	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
04 WATER	4.01	Stormwater Runoff Management	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	4.02	Reduce or Eliminate Irrigation Demands	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	4.03	Low-Flow Plumbing Fixtures	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	4.04	Low Impact Development (LID)	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	4.05	On-Site Water Reuse Strategies	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
05 ECONOMY	5.01	Right-Size the Program	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	5.02	Reduce Finish Materials	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	5.03	Increase Material Durability	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	5.04	Consult a Cost Estimator	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	5.05	Use and Maintain a Capital Budget	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
06 ENERGY	6.01	Enhanced Envelope	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	6.02	Energy Use	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	6.03	Energy Production	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	6.04	All-Electric	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	6.05	Building Automation System (BAS)	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
07 WELL-BEING	7.01	Prioritize Daylight and Priority Views	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	7.02	Promote Healthy Indoor Air Quality	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	7.03	Celebrate Public Circulation	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	7.04	Perform Acoustic Programming Analysis	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	7.05	Provide Occupiable and Inviting Outdoor Spaces	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
08 RESOURCES	8.01	Renovate Existing Where Possible	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	8.02	Specify Responsible Material Sourcing	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	8.03	Reduce Embodied Carbon	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	8.04	Reduce Construction Waste	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	8.05	Concrete Best Practices	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
09 CHANGE	9.01	Flexible / Adaptable Building Strategies	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	9.02	Anticipate the Future by Designing the Envelope for Tomorrow, Not Today	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	9.03	Community Resilisance Evaluation	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	9.04	Passive Survivability	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	9.05	FFE Re-Purpose and Product Lifecycle Assessment	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
10 DISCOVERY	10.01	Review Owner Project Requirements (OPR)	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	10.02	Commissioning	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	10.03	Provide O+M Manuals at Project Closeout	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	10.04	Post-OCC Evaluation / OAC (1-Year Post Occupancy)	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
	10.05	Utility Monitoring System	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-	Pick 1	-		Pick 1	-	
		80% achieved		###		###		###		###		###			###	
		Project Pass													##	

See the example below for a completed scoring matrix submitted after project closeout.

scoring matrix

project: **Ed Rice Community Center**
project address: 2935 North Watkins Street

City CIP No: PK01032
BD&C Project No: 15C06H
Designer Project No: 18405
Construction Contract No: 36969 CMAR
Construction Contract Date: 30 DEC 2019

Color Legend

Projected	Items projected to be incorporated into the project, but not yet verified.
Selected	Items presently selected to be incorporated into the project.
Achieved	Items verified as completed within the project.
Rejected	Items capable, but not incorporated into the project.
N/A	Items not applicable to the project, and do not count against % successful.

Design Principle	#	Action item	PD		SD		DD		CD		BN		CA	PO		Notes
			Action	Credit	Action	Credit	Action	Credit	Action	Credit	Action	Credit	Verify Contractor Compliance	Action	Credit	
01 INTEGRATION	1.01	Conduct a Visioning Charrette	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	multiple visioning charrettes completed in PD & SD phase
	1.02	Establish Project Goals	Selected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	1.03	Promote an Integrated Design Process	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	completed in SD phase
	1.04	Sustainable Design Consultant or Champion	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	added in SD phase
	1.05	Multi-Tasking Design Strategies	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
02 EQUITABLE COMMUNITIES	2.01	Development a Plan for Robust Stakeholder Engagement	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	2.02	Evaluation of Demographics, Transportation, Socio-Economic, Landscape of Surrounding Area	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	2.03	Enhance Public Infrastructure Connections on Project Site	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	2.04	Provide Open Public Space for Community Uses	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	2.05	Accomodation for Diverse Needs	Projected	1	Selected	1	Rejected	0	Rejected	0	Rejected	0		Rejected	0	mothers room removed in DD phase
03 ECOYSYSTEMS	3.01	Reduce Heat Island Effect	Projected	1	Projected	1	Projected	1	Selected	1	Selected	1		Achieved	1	TPO roof acceptance by CofM in CD phase
	3.02	Native Plant Species & Pollinator Gardens	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	3.03	Preserve Dark Skies	Projected	1	Projected	1	Projected	1	N/A	0	N/A	0		N/A	0	site lighting by CofM under separate contract
	3.04	Surrounding Site Analysis	Projected	1	Rejected	0	Rejected	0	Rejected	0	Rejected	0		Rejected	0	exising footprint and drainage design consistent with new design
	3.05	Conserve Native Habitats	Projected	1	Projected	1	Projected	1	Selected	1	Selected	1		Achieved	1	tree protection achieved in CA phase
04 WATER	4.01	Stormwater Runoff Management	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	4.02	Reduce or Eliminate Irrigation Demands	Projected	1	Projected	1	Rejected	0	Rejected	0	Rejected	0		Rejected	0	irrigation discussed with PM and included in the project
	4.03	Low-Flow Plumbing Fixtures	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	4.04	Low Impact Development (LID)	Projected	1	Projected	1	Projected	1	Selected	1	Selected	1		Achieved	1	
	4.05	On-Site Water Reuse Strategies	Projected	1	Rejected	0	Rejected	0	Rejected	0	Rejected	0		Rejected	0	water reuse disused with PM and rejected for the project
05 ECONOMY	5.01	Right-Size the Program	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	5.02	Reduce Finish Materials	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	5.03	Increase Material Durability	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	5.04	Consult a Cost Estimator	Selected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	independent estimator engaged by architect until CMGC selected
	5.05	Use and Maintain a Capital Budget	Selected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
06 ENERGY	6.01	Enhanced Envelope	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	6.02	Energy Use	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	6.03	Energy Production	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	6.04	All-Electric	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	6.05	Building Automation System (BAS)	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
07 WELL-BEING	7.01	Prioritize Daylight and Priority Views	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	7.02	Promote Healthy Indoor Air Quality	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	7.03	Celebrate Public Circulation	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	7.04	Perform Acoustic Programming Analysis	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	7.05	Provide Occupiable and Inviting Outdoor Spaces	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
08 RESOURCES	8.01	Renovate Existing Where Possible	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	8.02	Specify Responsible Material Sourcing	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	8.03	Reduce Embodied Carbon	Projected	1	Projected	1	Projected	1	Selected	1	Selected	1		Achieved	1	
	8.04	Reduce Construction Waste	Projected	1	Projected	1	Projected	1	Selected	1	Selected	1		Achieved	1	
	8.05	Concrete Best Practices	Projected	1	Projected	1	Projected	1	Selected	1	Selected	1		Achieved	1	
09 CHANGE	9.01	Flexible / Adaptable Building Strategies	Projected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	9.02	Anticipate the Future by Designing the Envelope for Tomorrow, Not Today	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	9.03	Community Resiliance Evaluation	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	9.04	Passive Survivability	Projected	1	Projected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	9.05	FFE Re-Purpose and Product Lifecycle Assessment	Projected	1	Rejected	0	Rejected	0	Rejected	0	Rejected	0		Rejected	0	FFE by CofM under separate contract
10 DISCOVERY	10.01	Review Owner Project Requirements (OPR)	Selected	1	Selected	1	Selected	1	Selected	1	Selected	1		Achieved	1	
	10.02	Commissioning	Projected	1	Projected	1	Projected	1	Projected	1	Selected	1		Achieved	1	
	10.03	Provide O+M Manuals at Project Closeout	Projected	1	Projected	1	Projected	1	Projected	1	Selected	1		Achieved	1	
	10.04	Post-OCC Evaluation / OAC (1-Year Post Occupancy)	Projected	1	Projected	1	Projected	1	Projected	1	Projected	1		Achieved	1	
	10.05	Utility Monitoring System	Projected	1	Projected	1	Rejected	0	Rejected	0	Rejected	0		Rejected	0	monitoring discussed with PM and postponed for future opportunity
		80% achieved		yes		yes		yes		yes		yes			yes	
		Project Pass													yes	

Design Principles

01

design for integration

Good design elevates any project, no matter how small, with a thoughtful process that delivers both beauty and performance in balance. It is the element that binds all the principles together with a big idea. Consider how your project might address the following:

- What is the concept or purpose behind the project and how will the priorities within the nine other principles inform the unique approach to this project?
- How will the project engage the senses and connect people to place?
- What makes this a project that people will fight to preserve?
- What design strategies can provide multiple benefits across the triple bottom line of social, economic, and environmental value?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

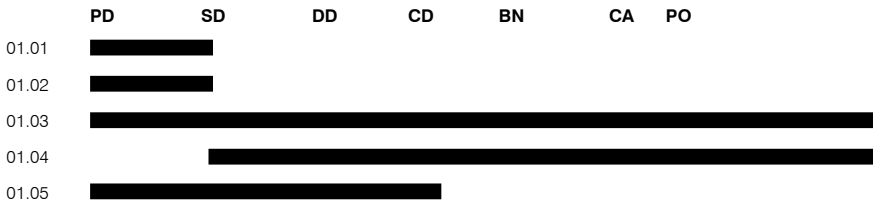


Figure 1a. Local institutions and organizations joined forces to re-purpose an existing 10-story unoccupied building into a mixed-use "urban village," ensuring programmatic and economic diversity.

Figure 1b. Community-centric design strategies and an value-forward material palette were implemented to ensure an open, equitable, and low-maintenance community center that will serve the community for decades.

“It’s not ‘us versus them’ or even ‘us on behalf of them.’ For a design thinker it has to be ‘us with them.’ ”

Tim Brown, IDEO

ACTION ITEMS

01.01 Conduct a Visioning Charrette

This process will guide the design team to better understand how design can respond to the driving forces behind client needs and their priorities for the project. Create a Vision Statement with the client to guide the aspiration of the project.

01.02 Establish Project Goals

Review and document Owner Project Requirements (OPR) and develop project goals with the design team and owner.

01.03 Promote an Integrated Design Process

Conduct a Design and Sustainability Charrette to elevate initial design thinking with performance-based concepts, informing aesthetic, form, space, systems, wellbeing, materials, etc. that respond to economic, environmental, and cultural conditions.

01.04 Sustainable Design Consultant or Champion

Identify a person or agency for this role to add value and contribute to the early process during schematic design in order to establish and track goals throughout the project.

01.05 Multi-Tasking Design Strategies

Implement design components that address minimum 3 Design Principles (i.e. a thoughtfully-designed community courtyard could contribute to equitable communities, ecosystems, water, well-being, and change) to achieve more integrated and impactful solutions.

02

design for equitable communities

Design solutions affect more than the client and current occupants. Good design positively impacts the future by helping communities thrive - socially, economically, and environmentally. Consider how your project might address the following:

- What is the project's greater reach? How could this project contribute to creating a diverse, accessible, walkable, just, and human-scaled community?
- Who might this project be forgetting? How can the design process and outcome remove barriers and promote inclusion and social equity, particularly with respect to vulnerable communities?
- What opportunities exist in this project to include, engage, and promote human connection?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

Figure 2a. Built on the site where Martin Luther King, Jr. was assassinated, this museum is deeply rooted in culture and place. Renovations have sought to modernize and enrich community engagement, while preserving the site's rich history.

Figure 2b. Architects mediate a conversation between the client and community members to ensure the implementation of equitable action and design strategies.

"We need to give each other the space to grow, to be ourselves, to exercise our diversity. We need to give each other space so that we may both give and receive such beautiful things as ideas, openness, dignity, joy, healing, and inclusion."

Max De Pree

ACTION ITEMS

02.01 Development a Plan for Robust Stakeholder Engagement

Conduct multiple community meetings with diverse methods to invite participants. Make an extra effort to include people whose participation is inconvenient.

02.02 Evaluation of Demographics, Transportation, Socio-Economic, Landscape of Surrounding Area

Provide analysis and understanding for contextual factors that should contribute to more robust design strategies.

02.03 Enhance Public Infrastructure Connections on Project Site

Provide improvements and clear connectivity to accessible public amenities (i.e. sidewalks, public transit, nearby transit stops, etc.).

02.03 Provide Open Public Space for Community Uses

Ensure the project does not inhibit universal access to nature and public amenities.

02.05 Accommodation for Diverse Needs

Provide inclusive strategies for a spectrum of user needs, including but not limited to universal design strategies, gender neutral restrooms, mothers' room(s), and incorporating best design practices for neurodivergent individuals.

03

design for ecosystems

Good design mutually benefits human and nonhuman inhabitants. Consider how your project might address the following:

- How can the design support the ecological health of its place over time?
- How can the design help users become more aware and connected with the project's place and regional ecosystem?
- How can the design build resilience while reducing maintenance?
- How is the project supporting regional habitat restoration?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

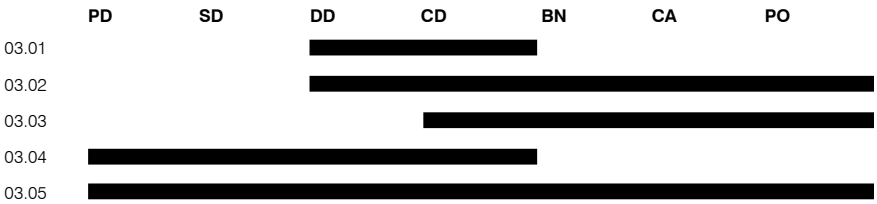


Figure 3a. A focus on ecology will play a pivotal role in reshaping Memphis' relationship to the Mississippi River: an activated and ecologically restorative urban park.

Figure 3b. Vegetative and water-friendly design strategies ensured the preservation of existing ecosystems and a holistic approach to introducing new ones.

"Design is the first signal of human intentions. If it's not our intention, then what's our plan? The question becomes how we can behave in a way that works."

William McDonough

ACTION ITEMS

03.01 **Reduce Heat Island Effect** (include all)

(A) Maximize tree and vegetation cover on the site and minimize building footprint by stacking program and maximizing efficiency. Incorporate proper minimum soil volumes for root health and viability.

(B) Design and specify a cool or vegetated roof:
- minimum SRI of 82 for a roof with less than 2:12 slope
- minimum SRI of 39 for a roof with a 2:12 or higher slope

(C) Design and specify cool pavements:
- Shade hard surfaces with landscaping or design elements.
- Use paving materials with an SRI of 29 or greater.
- For existing paved site elements, utilize resurfacing, sealers, or white-topping to increase reflectivity.
- All paving materials are to have an SRI of 29 or greater.

03.02 **Native Plant Species & Pollinator Gardens**

Utilize native plant species as a minimum of 50% of the plant palette. Consider the following to encourage pollinator habitat:
- Arrange a diversity of plant species in groups to support a greater number and diversity of pollinators.
- Include larval host plants in the landscape, placed in less visible areas, due to leaf damage.
- Create a landscape maintenance plan to avoid the use of pesticides.
- Include phytoremediation focused plant materials to promote healthy cleaning of soil and water.

03.03 **Preserve Dark Skies** (include all)

(A) Specify all exterior luminaries to be full cutoff and aimed toward the surface requiring illumination.

(B) General site lighting will be designed to turn on at sunset and turn off by the time occupants have left the property. Where nighttime security is required, a combination of night-vision cameras and motion-activated lights can be used to keep the site both dark and safe.

03.04 **Surrounding Site Analysis** (include all)

(A) Identify and map major ecological & hydrological components (i.e. flood plains, drainage basins, wetlands, etc.) within 1 mile of the site.

(B) Develop a strategy to conserve, rehabilitate, and/or protect. Prioritize environmental factors and implement passive design strategies relative to the local climate of the surrounding site.

03.05 **Conserve Native Habitats** (include all)

(A) Minimize cut & fill and project footprint to lessen the impact to existing ecosystems.

(B) Establish a tree protection plan during construction to preserve existing trees on-site.

(C) Preserve and/or create landscape elements to support habitats for local flora and fauna.

04

design for water

Good design conserves and improves the quality of water as a precious resource.
Consider how your project might address the following:

- How does the project use water wisely, addressing efficiency and consumption while matching water quality to appropriate use?
- How can the project's water systems maintain function during emergencies or disruptions?
- How does the project handle rainfall and stormwater responsibly?
- How does the project contribute to a healthy regional watershed?

[source: AIA's Framework for Design Excellence]

Action Items Implementation Phase Guide

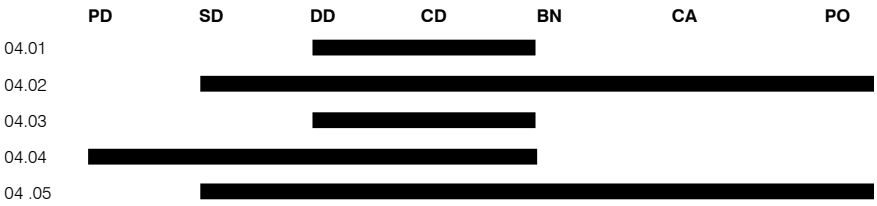


Figure 4a. The water-wise landscaping subtly softens the parking lot, creating bioswales that, in tandem with porous paving, capture stormwater runoff.

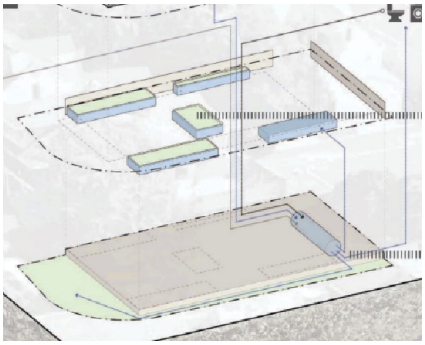


Figure 4b. Stormwater runoff is captured and reused on-site, ensuring a sustainable and renewable building design.

"Water is the most critical resource issue of our lifetime and our children's lifetime. The health of our waters is the principal measure of how we live on the land."

Luna Leopold

ACTION ITEMS

04.01 **Stormwater Runoff Management** (include all)

(A) The amount of site stormwater runoff should match or decrease the site's pre-development conditions.

(B) Sites shall comply with either of the following options:

1. Impervious site coverage (including building footprint) is to make up no more than 65% of the total site area.
2. Pervious and permeable site coverage is to make up 75% or more of site surfaces with slopes less than 5% (not including building footprint).

   *Calculate pervious materials and products with a void ratio of <50% at half of the actual site coverage area.

04.02 **Reduce or Eliminate Irrigation Demands** (include all)

(A) Specify 100% of the project's plant palette to be comprised of native and water-wise plant species.

(B) While not required, temporary potable water irrigation systems are permitted to be installed for the purpose of plant establishment. When included, create an establishment water strategy to include a reduction phase after 3 growing seasons with availability for intermittent use during future drought conditions.

04.03 **Low-Flow Plumbing Fixtures**

Specify the following maximum water flow rates for fixtures:

toilets	1.28 gpf
urinals	0.50 gpf
lavatories	0.35 gpm (metered or sensor-operated)
kitchen faucets	1.75 gpm
showers	2.00 gpm

04.04 **Low Impact Development (LID)** (include 1 minimum)

From the following engineered systems:

(A) Modifications to infrastructure to decrease the amount of impervious surfaces and subsequent runoff: curbless, gutterless, and reduced drive or street widths

(B) Design and implement filtration, retention, and/or storage systems: bioretention cells, filter strips, and tree box filters, sub-surface collection facilities under parking lots, and infiltration trenches.

04.05 **On-Site Water Reuse Strategies** (include 1 minimum)

(A) Design a rainwater and/or graywater harvesting and filtration system to reuse water for the following purposes, as deemed appropriate: permanent or temporary landscape irrigation, toilet and urinal flushing, clothes laundering and/or facility cleaning, cooling tower systems.

(B) Design green roofs as a water reuse strategy to reduce runoff, filter pollutants, and cool roof surfaces.

(C) Design and integrate a water recycling system for an On-site Non-Potable Water System (ONPWS).

05

design for economy

Good design adds value for owners, occupants, community, and planet, regardless of project size and budget.
Consider how your project might address the following:

· How do we provide abundance while living within our means?

· How will the design choices balance first cost with long-term value?

· How can the performance of this project be improved in ways that are cost and design neutral?

[source: AIA's Framework for Design Excellence]

Action Items Implementation Phase Guide

Figure 5a. An economical and durable material palette of brick and metal enabled the ample use of glass. This contributes to the daylighting benefits of openness and community engagement.

Figure 5b. The Ed Rice Community Center gym also serves as a banquet center with table storage, catering kitchen access, and a stage.

"There is no beauty in the finest cloth if it makes hunger and unhappiness."

Mahatma Gandhi

ACTION ITEMS

05.01 Right-Size the Program (include 3 minimum)

(A) Employ strategies to reduce square footage (SF) - determine the benchmark building efficiency ratio (net SF / gross SF) for the program type and set a goal to exceed that benchmark. Use the Building Efficiency Ratio Guidelines publication by the University of New Mexico to determine a benchmark for your program type.

(B) Program for typical building operations rather than for occasional overflow events.

(C) Identify program elements that may overlap or spaces that can serve multiple purposes on a time-of-use basis.

(D) Seek maximum parking reduction opportunities allowed by the Unified Development Code.

05.02 Reduce Finish Materials

Eliminate superfluous finish materials to decrease cost/SF. Prioritize using materials that can serve multiple functions (i.e. structural integrity, fire resistance, low maintenance, etc.).

05.03 Increase Material Durability

Reduce future maintenance requirements by choosing durable, long-lived materials.

05.04 Consult a Cost Estimator

Involve a Cost Estimator as a sub-consultant early in the design process and update the cost estimate at each phase of design.

05.05 Use and Maintain a Capital Budget

Refer to the appendix for a 6-Part Capital Budget outline that holistically tracks project costs from project inception and is updated at each phase of design and construction. See below for the 6 major categories of cost to track, which can be added to or subtracted from as the project dictates.

1. Site Acquisition
2. Core and Shell
3. Interior Build-Out
4. Furniture, Fixtures, and Equipment (FFE)
5. Designer & Consultant Fees
6. Owner / Operator Costs

06

design for energy

Good design reduces energy use and eliminates dependence on fossil fuels while improving building performance, function, comfort, and enjoyment.
Consider how your project might address the following:

- How can passive design strategies contribute to the project's performance and form?
- How can the project exceed building code efficiency standards to approach net zero energy and net zero carbon?
- Can the project be powered by clean, renewable energy sources?
- How can the project provide for continuous performance improvements over its lifetime?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

Figure 6a. The translucent wall at this hospital maximizes daylight while moderating heat gain.

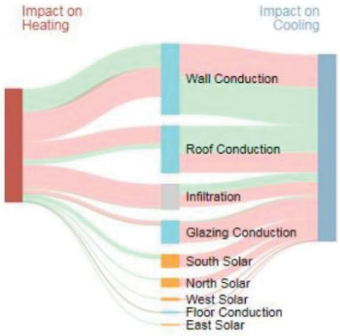


Figure 6b. An energy model expresses a building design's impact on heating and cooling loads.

"The building industry is the largest energy-consuming and greenhouse-gas emitting sector; close to double any other sector. It's important for us to understand that we are a large part of the problem, but we are also a large part of the solution."

Edward Mazria

ACTION ITEMS

06.01 **Enhanced Envelope** (include all)

(A) For new exterior envelope construction, design with a Window-to-Wall Ratio (WWR) between 20 and 40% with the goal of balancing daylighting and views with energy performance.

(B1) For new exterior envelope construction, design and specify exterior wall, roof, and floor R-values to be at least 10% more insulative than code minimum OR design and specify minimum R-3 continuous insulation for all exterior surfaces (Excluding under foundation). For renovations, determine existing R-Value of existing exterior assemblies and supplement accordingly to comply with same criteria above.

(B2) For existing buildings, investigate existing envelope conditions and determine proper design strategy with the CofM Project Managers review and approval.

06.02 **Energy Use** (include all)

(A) Establish project benchmarks for Energy Use Intensity (EUI), Light Power Density (LPD), and plug loads in Design Development. Target a reduction goal of 25% from baseline. (to establish baseline see zerotool.org and/or CBECS 2003/RECS 2001 data.)

(B) Produce an energy model during Schematic Design to inform and optimize the design and performance. Update the energy model at Design Development and Construction Documentation phases as the design progresses to ensure that energy goals are being tracked and met.

06.03 **Energy Production** (include 1 minimum)

(A) Design and specify all buildings and systems to be generator-ready and solar-ready (including roof design and adequate clear roof areas, and plan for appropriate meters, electrical panel capacity, and electrical room design.) For generators, determine a resilience/performance strategy with the CofM Project Manager.

(B) Design and specify a photovoltaic (PV) solar array to provide on-site energy production; target minimum daily design energy production to supply the energy use of all buildings and systems on-site on the least energy-intensive day of the year. Design the system to be expanded over time, with future PV panels and battery storage to support all building and site energy needs on the most energy-intensive day of the year.

(C) Design and specify a geothermal heat pump system to supply at minimum 25% of the building's heating and cooling needs.

06.04 **All-Electric**

Design the project's systems to be all-electric (no fossil fuels).

06.05 **Building Automation System (BAS)**

Provide a building Automation System (BAS) to program HVAC and other equipment to manage setbacks during unoccupied times. Require proper Owner system training by the Contractor.

07

design for well-being

Good design supports health and well-being for all people, considering physical, mental, and emotional effects on building occupants and the surrounding community.
Consider how your project might address the following:

· How can the design encourage a healthy lifestyle?
· How can the project provide for greater occupant comfort?
· How can the project be welcoming and inclusive for all?
· How can the project connect people with place and nature?
· How can material selection reduce hazards to occupants?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

Figure 7a. Daylight is celebrated in a space that brings in filtered natural light and connects occupants through a welcoming common space centered around a grand stair.

Figure 7b. A street-facing covered porch allows outdoor spaces to be occupied even during hot summer months and encourages social interaction and activity. The stained wood siding utilizes a natural materials to create an inviting and comfortable atmosphere.

"Study nature, love nature, stay close to nature. It will never fail you."

Frank Lloyd Wright

ACTION ITEMS

07.01 **Prioritize Daylight and Quality Views** (include 1 minimum)

(A) Perform interactive daylight modeling to inform design. Ensure that 75% or regularly occupied spaces have a minimum daylight illumination level of 25 horizontal footcandles under clear sky conditions at noon on the equinox. This needs to be measured 30" above the floor.

(B) Democratize daylight: move shared and work spaces to the perimeter of a floor plate, where access to daylight can benefit the most people.

07.02 **Promote Healthy Indoor Air Quality** (include all)

(A) Provide vestibules and walk-off mats

(B) Specify Low to No VOC products and finishes

(C) Do not use ILFI 'Red List' items.

(D) Provide ongoing indoor air quality monitoring via sensor systems.

07.03 **Celebrate Public Circulation**

Prioritize a ceremonial/grand stair to encourage occupant movement. If the building is only one level, provide generous and welcoming spaces that promote human health and interaction.

07.04 **Perform Acoustic Programming Analysis**

Create a sound map with color coding: loud, quiet, mixed, and circulation space to inform design and detailing.

07.05 **Provide Occupiable and Inviting Outdoor Spaces**

Design desirable outdoor spaces for people to inhabit: consider sun-shading, views, frequent noise sources, and power and data accessibility to offer more choices in workspace environments.

08

design for resources

Good design depends on informed material selection, balancing priorities to achieve durable, safe, and healthy projects with an equitable and sustainable supply chain.
Consider how your project might address the following:

- How are materials and products used to reduce embodied carbon and environmental impacts while enhancing building performance?
- How can material selection reduce hazards and support equitable labor practices in the supply chain?
- How does the project promote zero waste throughout its life cycle?
- How does the project celebrate local materials and craft?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

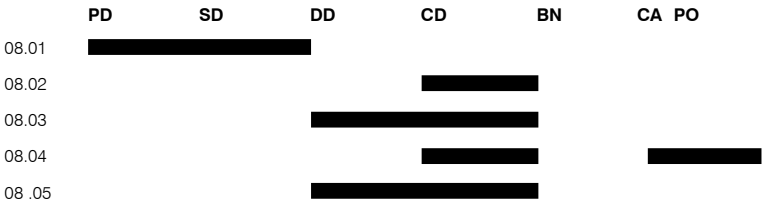


Figure 8a. The restoration and repurposing of this historic building in downtown Memphis has preserved the building's history and status as a landmark of African-American design and enterprise, while giving it new life.

Figure 8b. This high school occupies a portion of the renovated Crosstown Concourse, utilizing a robustly constructed existing building and filling in with a dynamic space and considered materials.

"While attention often centers on carbon-smart strategies for new construction, we will not build our way to an emission-free built environment; we must reuse existing building stock effectively."

Erin McDade & Lori Ferris

ACTION ITEMS

08.01 Renovate Existing Where Possible

On a site with existing sitework or building elements, develop a strategy to fully or partially reuse existing components.

08.02 Specify Responsible Material Sourcing (include all)

(A) Specify products and materials with Environmental Product Declarations (EPD), Healthy Product Declarations (HPD), and/or Declare labels as part of the basis of design and require them to be documented in construction submittals.

(B) Specify materials with recycled content equal to or greater than 10% of the total material cost of the project.

(C) Specify FSC (or similar third party verified) certified wood.

(D) Develop a local material palette based on availability, with at least 15% of the total material and product value to be sourced (extracted, harvested, recovered, and manufactured, as applies) from within a 500 mile radius. Specify only domestically sourced materials and products.

08.03 Reduce Embodied Carbon (include all)

(A) Choose lower carbon alternatives for interior and exterior components (ie: a wood structure instead of steel and concrete). Review product EPDs to identify lower carbon options.

(B) Where appropriate and available, choose carbon sequestering agricultural products (wood, carbon sequestering concrete, cellulose insulation).

(C) Specify low-carbon insulation like cellulose and mineral wool. Minimize spray foam and, where used, specify hydroflouroolefin (HFO) rather than hydrofluorocarbon (HFC) as a blowing agent.

08.04 Reduce Construction Waste

Specify a tracked construction waste diversion program to be reported by the General Contractor throughout the construction process.

08.05 Concrete Best Practices

Portland cement accounts for roughly 90% of concrete CO_2 emissions. Reduce portland cement content in concrete by a minimum of 10%. Strategies may include:

1. Substituting portland cement with alternative materials. like fly ash, silica fume, and ground granulated blast-furnace slag (GGBS).
2. Extending concrete curing time from 28 to 56 days.
3. Specifying portland limestone cement (PLC), which produces 10% lower CO_2 emissions than portland cement.
4. Specifying limestone calcined clay cement (LC^3-50), which produces 40% lower CO_2 emissions than portland cement.

09

design for change

Adaptability, resilience, and reuse are essential to good design, which seeks to enhance usability, functionality, and value over time. Consider how your project might address the following:

· How does the project address future risks and vulnerabilities from social, economic, and environmental change?

· How is the project designed for adaptation to anticipate future uses or changing markets?

· How does the project address passive survivability and/or livability?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

Figure 9a. This renovated facade was repaired with bricks salvaged from buildings in the surrounding area.

Figure 9b. This project consisted of an interior gut and renovation of a mid-century government building, providing 172,000 sf of revitalized space, reduced energy loads, and modernized building systems.

"The best way to predict the future is to design it."

Abraham Lincoln

ACTION ITEMS

09.01 Flexible / Adaptable Building Strategies (include all)

(A) For new buildings, incorporate a regular structural grid with generous spans horizontally and 12' clear to bottom of structure vertically to accommodate future repurposing of buildings, future new space programs, and future Owner use flexibility.

(B) Specify durable materials, low maintenance details, and exterior materials and assemblies when exposed to extreme temperatures or prolonged flooding.

09.02 Anticipate the Future by Designing the Envelope for Tomorrow, Not Today

Design a high performance envelope to conserve when energy might be scarce:

1. Prioritize air tightness
2. Specify products with and detail thermally-broken assemblies at building envelope
3. Window-to-wall ratio less than 25%
4. High performance glazing

09.03 Community Resilience Evaluation

Identify current and future risks and vulnerabilities for Memphis (i.e. earthquakes, tornadoes, and flooding, pandemics, extreme temperatures, utility disruption, potential social or economic events such as civil unrest and cyber attacks); with input from the City, determine if the project might be considered a safe zone or emergency center.

09.04 Passive Survivability

Incorporate operable windows, daylighting, and where applicable, on-site power sourcing or redundancy to critical systems to support the building.

09.05 FFE Re-Purpose and Product Lifecycle Assessment *(include 1 minimum)*

(A) Specify upcycled furniture, fixtures, and equipment (FFE) components.

(B) Specify manufacturers that provide a re-purpose and/or recycle program for furniture, fixtures, and equipment (FFE). These products and programs should demonstrate whole life cycle assessment (LCA) data.

10

design for discovery

Every project presents a unique opportunity to apply lessons learned from previous projects and gather information to refine the design and construction process. Consider how your project might address the following:

- How can the design process foster a long-term relationship between designers, users, and operators to ensure deign intentions are realized and building project performance can improve over time?
- How are performance data and experiential stories shared, even if the findings fall short of the vision?
- How are lessons learned through construction administration shared to project teams?
- What strategies promote a sense of discovery and delight?

[source: AIA's Framework for Design Excellence]

Action Item Implementation Phase Guide

Figure 10a. Post-occupancy analysis has proven an effective tool for fine-tuning system efficiency in this Midtown office building.

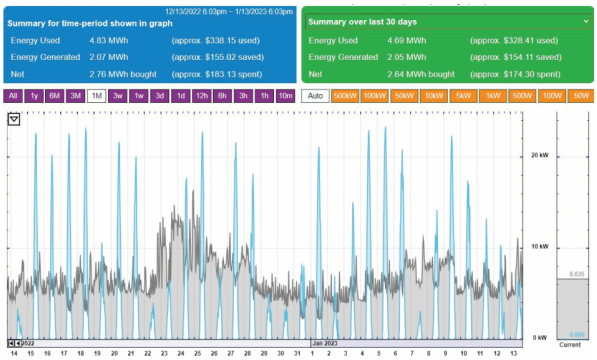


Figure 10b. Documenting energy consumption post-occupancy is a powerful tool in evaluating the effectiveness of design strategies.

"When we design something, we set up its emissions pattern for the next 50 years, or however long a building or community stands."

Edward Mazria

ACTION ITEMS

10.01 Review Owner Project Requirements (OPR)

Review OPR with PM and facility leadership to formalize criteria for design and construction evaluation.

10.02 Commissioning

Design and teach PM and client representative and/or facility manager how the passive design strategies should perform and how the active systems can be effectively operated.

10.03 Provide O+M Manuals at Project Closeout

Formalize project closeout with documentation provided to PM and client representative/facility manager as operation and maintenance (O+M) manuals.

10.04 Post-OCC Evaluation / OAC (1-Year Post Occupancy)

The designer and key team members will meet with the PM and client representative/facility manager for design review and post occupancy evaluation.

10.05 Utility Monitoring System

Specify a project utility monitoring system (i.e. energy consumption by component type, renewables, water, irrigation, etc.) for facility management to monitor performance of project during operations.

Division Standards

11 consultant responsibilities

NOTES

Items in this section provide the Consultant with additional direction pertaining to responsibilities required in the Basic Services contract language, and is organized in “Design Phase” and “Construction Phase” components.

During Design Phase, the Consultant shall:

D1. Discuss the project-specific regulatory requirements with the CofM Project Manager on an as-needed basis.

D2. Coordinate the required schedule of testing needs for the Project with the CofM Project Manager, and verify the Contractor is submitting on a regular basis.

D3. Coordinate and contract for the following independent testing services as a reimbursable expense to the CofM.

A. Soils testing, including:

I. Soil classification including plasticity index and liquid limit.

II. Sieve analysis.

III. Laboratory compaction test, standard and modified proctor of relative density test.

IV. Field compaction test.

V. Borings.

VI. Technician inspecting time.

B. Concrete testing, including:

I. Compressive strength.

II. Technician time such as casting, delivery of test cylinders, slump test, air content test.

III. Post tensioning or pre-stressing of tendons.

C. Structural Steel testing, including:

I. Bolt torque inspection.

II. Weld inspection.

D4. Tie all topographical survey work into the CofM Benchmark system. For additional information contact the City of Memphis Survey Service Center.

D5. Engage the services of a Certified Arborist to asses trees determined to be at risk for construction impacts and recommend measures to mitigate those impacts. These measures shall be included in the construction documents.

NOTES

D6. Comply with all Erosion Control requirements of local, state, and federal agencies, including TDEC, TDOT, the EPA, and the US Army, Corps of Engineers, and the CofM Storm Water Standard Requirements. Consultant shall submit a Notice of Intent (NOI), and Storm Water Pollution Prevention Plan (SWPPP) to TDEC in order to receive a Notice of Coverage (NOC) prior Project Bidding. Provide a copy to the NOC to the CofM Project Manager and to Public Works Environmental Engineer. The Consultant shall reimburse the cost of permitting to the CofM Project Manager.

D7. Follow the recommendations of the geotechnical report for parking lot and driveway designs. Areas and pathways for heavy trucks shall follow heavy-duty section recommendations in the geotechnical report.

D8. Comply with all local, state, and federal laws and code requirements as they apply to the Project, including compliance with all ADA guidelines. In the event codes conflict, the most stringent code shall apply.

D9. Design to 100% compliance with all interior and exterior ADA guidelines applicable to a Project, including a margin of error to allow an adjustment for any possible variations in field conditions and installation tolerances. Consultant shall employ sub-consultants if needed to comply with all ADA guidelines. When the CofM employs an ADA Consultant, their review shall be incorporated into drawings in order to meet compliance.

D10. Verify and identify ADA accessible route(s) from each property point of entry to the accessible entry of each building. Property points of entry include, but are not limited to, curb ramps, accessible parking spaces and other buildings.

D11. Meet with the Shelby County Construction Code Enforcement Office, Fire Marshal, (and Shelby County Health Department if required) at the Schematic Design and Design Development phases of the Project to ensure code compliance. The Consultant shall invite the CofM Project Manager, and document the meetings with minutes for distribution. All deficiencies noted in review comments shall be addressed by the Consultant within the design documents at no cost to the Owner. Any construction cost increases after bid opening due to a failure to obtain and incorporate code review comments shall be the responsibility of the Consultant.

D12. Submit a Fire Prevention Plan to the Fire Marshal during the Design Development phase for review and approval of the minimum requirements of the fire protection system, including location of Fire Department Connection (FDC) and site hydrant locations. Fire Marshall approval of 100% Construction Documents will be required prior to securing a building permit.

D13. Submit 100% Construction Documents to the Shelby County Construction Code Enforcement Building Department, Fire Marshal, (and Shelby County Health Department if required) for review as soon as they are complete. Any deficiencies noted in review comments shall be addressed by the Consultant within the design documents at no cost to the Owner, and without delaying the Bid Date. Any construction cost increases after bid opening due to a failure to obtain and incorporate code review comments shall be the responsibility of the Consultant. Copies of reviews and certification of final approvals shall be forwarded to the CofM Project Manager.

NOTES

D14. Meet with the CofM Project Manager at each phase of the Project to insure that all City of Memphis needs are met in the Bid documents. Any construction cost increases after bid opening due to a failure to obtain and incorporate CofM review comments shall be the responsibility of the Consultant.

D15. Meet with Memphis Light, Gas and Water Division (MLGW) at the Schematic Design phase of the Project to ensure adequate utilities can be provided to the Project, including electric, water, and fire hydrant capability. Natural gas is not encouraged for CofM projects. The Consultant is to coordinate any major changes throughout the design phased with MLGW to ensure utility capabilities. The Consultant shall invite the CofM Project Manager, and document the meetings with minutes for distribution.

D16. Meet with the IT Division, CofM Project Manager, and User in Schematic Design phase and incorporate the low voltage rough-in requirements for telephones, data networks, access controls, and security cameras into the final construction documents. IT Division will verify camera and wifi locations via coverage maps. Vigilan or Verkada cameras are standard in CofM projects. Avigilon Access Control (AAC) software is standard for all access control system installations.

D17. Specify, detail, and size the appropriate mockups as required of the Project.

D18. Provide design verification data on an as-needed basis as required by the Project and of the CofM Project Manager, including but not limited to:

A. Lighting photometrics (footcandles) with daylighting,

B. Acoustic / sound mapping,

C. Truck turn radius verifications for delivery trucks, refuse trucks, firetrucks, etc.

During Construction Phase, the Consultant shall:

C1. Be responsible to enforce quality control requirements as indicated throughout the contract documents, and shall enforce “Professional Workmanship and Execution”, “Industry Standards, Specifications”, “Manufacturer’s Directions”, and required follow up for field samples, details, submittals, and references.

C2. Routinely review erosion control measures during construction and notify the Contractor and CofM Project Manager of any deficiencies observed in writing.

C3. Routinely track and review the mockups as required of the Project, and ensue the Contractor is providing mockups in a timely manner.

C4. Administrate Construction Progress (OAC) meetings held on a biweekly basis, including:

A. Issue a recurring meeting invitation via email to all appropriate participants.

B. Prepare a recurring agenda and share that agenda within 48 hours prior of meeting in order for additions from participants

C. Chair the meeting and document meeting minutes which are to

be distributed within 3 days of the meeting.

NOTES

D. Observe the progress of the work with respect to the construction schedule and compliance with the contract documents. Advise the Owner and Contractor of any deficiencies.

C5. Observe applications of dampproofing and waterproofing during construction and verify compliance with manufacturer recommendations.

C6. Not make any changes (substitutions) to previously approved materials, products, or processes, in the design phase, without approval of the CofM Project Manager, Property Maintenance, and the User in writing.

C7. Obtain approval for construction substitutions during Bidding for an “or equal” specified product or process, first by the Consultant, then by the Owner via official Substitution Request from the Contractor.

C8. Verify the Contractor has received the following items prior to scheduling the Substantial Completion Inspection:

A. Receipt of approvals by the Authorities Having Jurisdiction and the ADA Consultant.

B. Received the Certificate of Occupancy.

C. Consultant has reviewed the Work and notified Contractor in writing of “request approved” for Owner’s Substantial Completion Inspection. Schedule the Substantial Completion Inspection and include the following attendees:

I. CofM Project Manager, Property Maintenance, the User, and the CofM ADA Consultant (if needed),

II. Subcontractor and major subcontractors,

III. Consultant and subconsultants.

C9. Compile a list (Punch List) of incomplete or incorrect items during the Substantial Completion Inspection, incorporate lists from the CofM team, and distribute list to the Contractor for distribution to all attendees.

C10. If Substantial Completion is rejected:

A. Notify the Contractor in writing and request deficiencies corrected in order for the Contractor to request a subsequent Substantial Completion Inspection.

C11. If Substantial Completion is accepted:

A. Issue a Certificate of Substantial Completion, and notify the Contractor has 30 days to correct deficiencies indicated in the Punch List in order to schedule a Final Completion Inspection.

C12. Notify the Contractor, upon receipt of Substantial Completion acceptance, to provide a copy of the latest MLGW utility bill for the Project related account, and a letter from the Contractor to MLGW requesting account transfer to the CofM. The CofM will then assume the cost of MLGW utilities at the time of successful account transfer.

C13. Verify the Contractor has corrected deficiencies indicated in the Punch List prior to scheduling the Final Completion Inspection, then the Consultant shall schedule the Final Completion Inspection and include the Consultant, Contractor, and CofM Project Manager. Other may be invited on an as-needed basis.

NOTES

C14. Compile a Final Punch List of incomplete or incorrect items during the Final Completion Inspection, incorporate lists from the CofM team, and distribute list to the Contractor for distribution to all attendees.

C15. If Final Completion is rejected:

A. Notify the Contractor in writing and request deficiencies corrected no more than 7 days in order for the Contractor to request a subsequent Final Completion Inspection.

C16. If Final Completion is accepted:

A. Issue a Certificate of Final Completion and notify the Contractor has 14 days from receipt of the Certificate of Final Completion to deliver all project closeout materials and inventory to the Consultant.

C17. Schedule an 1-year Post-Occupancy Evaluation of the Project (separate from the 1-year warranty period). The Consultant, CofM Project Manager, Property Maintenance, the User, and Contractor (and as-needed key team members) will meet for design and construction review and post occupancy evaluation of the Project for the Design for Discovery phase of this Design Directive.

NOTES

12 administrative specifications

NOTES

Items in this section provide the Consultant with additional direction pertaining to administrative responsibilities required in the Drawings and/or Specifications, and is organized in “Division 0 - Bidding and Contract Requirements” and “Division 1 - General Requirements of the Project Manual” components.

Within Division 0 - Bidding and Contract Requirements, the Consultant shall:

0.1. Include the following standard specifications sections for each project, edited by the Consultant for the specific needs of the Project. Obtain the most current versions from the City Project Manager. Note the General Contractor for Construction Contract varies slightly from the Construction Manager at Risk (CMAR) Contract.

A. 00010 - Legal Notice to Bidders

B. 00100 - Instructions to Bidders

C. 00310 - Bid Form

D. 00410 - Bid Bond

E. 00420 - Certificate of Non-Discrimination

F. 00430 - Equal Business Opportunity Program

G. 00440 - Certificate of Drug Free Workplace

H. 00510 - Construction Contract

I. 00520 - Escrow Agreement

J. 00610 - Performance Bond

K. 00640 - Partial Release of Liens for Subcontractors

L. 00641 - Final Release of Liens for Subcontractors

M. 00642 - Final Release of Liens for General Contractors

N. 00710 - General Conditions of the Contract

O. 00850 - Index of Drawings

0.2. Include the entire work of the Project, excluding pre-approved alternates in Base Bid. If alternates are included in the Construction Documents, they shall be separate from Base Bid. MWBE goals shall only apply to Base Bid. Approved alternates shall be tracked appropriately on Pay Requests.

NOTES

0.3. Include Standard Unit Prices (when applicable) for Sod, Hydroseeding, Top Soil, and Unsuitable Soils. Other Unit Prices may be issued for the Project within the Construction Documents. Unit Prices shall be tracked appropriately on Pay Requests.

0.4. Require that construction Substitution Requests during Bidding for an “or equal” specified product or process shall be submitted via official Substitution Request to the Consultant, and must be approved by the Consultant and the Owner no later than 7 calendar days before the Bid. Requests after that date will not be considered.

0.5. Require that Substitution Requests for an “or equal” specified product or process shall include all pertinent information necessary for complete “or equal” evaluation and consideration by the Consultant and the Owner.

0.6. Require that no substitution of equipment will be allowed after bids have been accepted.

Within Division 1 - General Requirements of the Project Manual, the Consultant shall:

1.1. Include the following standard specifications sections for each project, edited by the Consultant for the specific needs of the Project. Obtain the most current versions from the City Project Manager. Note the General Contractor for Construction Contract varies slightly from the Construction Manager at Risk (CMAR) Contract.

A. 01320 - Contract Modification for Weather Delays

B. 018113 - Sustainable Design Requirements

1.2. Include Standard Unit Prices (when applicable) for Sod, Hydroseeding, Top Soil, and Unsuitable Soils. Other Unit Prices may be issued for the Project within the Construction Documents. Unit Prices shall be tracked appropriately on Pay Requests.

1.3. Require that Contractor Pay Requests shall not exceed 1 per calendar month. The Contractor shall provide a proposed Pay Request Schedule of Values within 2 weeks of Notice To Proceed being issued.

1.4. Include standard construction allowances for unsuitable soils and MLGW utility allowances. Other Allowances may be issued for the Project within the Construction Documents. Allowances shall be tracked appropriately in the Capital budget and on Contractor Pay Requests. Specify no Contractor markup on allowances.

1.5. Require the Contractor to provide a submittal and mock-up schedule within 2 weeks of Notice To Proceed being issued. The Contractor shall include the submittal schedule with the final closeout documents.

1.6. Require the Contractor to provide a schedule of the required testing needs for the Project within 2 weeks of Notice To Proceed being issued.

1.7. Require the Contractor to acquire temporary utilities with MLGW and will be fully responsible for utilities until the acceptance of Substantial Completion.

1.8. Require the Contractor to provide a field office for the project, which location, size and capabilities shall be pre-approved by the CofM Project Manager.

1.9. Require the Contractor to provide appropriate first aid materials for all

NOTES

workers and visitors to the project site.

1.10. Require the Contractor to provide sanitary facilities. Existing CofM facilities are not to be used.

1.11. Require the Contractor to provide temporary fencing with the appropriate “danger” signage around all project sites. Where a facility is in use during construction the Contractor shall include the appropriate barriers to protect occupants from noise, dirty air, and dangerous situations.

1.12. Require the Contractor to coordinate initial site clearing and tree protection with the CofM Project Manager. The Contractor shall engage a certified arborist to perform any required repair or protection efforts. Damage to trees at any stage of the construction process will not be tolerated.

1.13. Require the Contractor to be responsible for proper watering and protection of plant materials on-site during construction, including lawn/grass areas. Any plant material that is destroyed or damaged is to be replaced at no cost to the Owner. Any trees that are damaged may be repaired by a Certified Arborist to the CofM Project Manager satisfaction, at no cost to the Owner.

1.14. Require the Contractor to schedule all Starting and Adjusting procedures at least 1 month in advance of Substantial Completion with the Consultant, Owner, and CofM Property Maintenance personnel so they may observe as systems are made operational, tested, and balanced.

1.15. Require the Contractor to request Substantial Completion Inspection only after the following items have been achieved:

A. Receipt of approvals by the Authorities Having Jurisdiction and the ADA Consultant.

B. Received the Certificate of Occupancy.

C. Consultant has reviewed the Work and notified Contractor in writing of “request approved” for Owner’s Substantial Completion Inspection.

1.16. Require that the Contractor and major subcontractors shall be present at the Substantial Completion Inspection.

1.17. Require the Contractor to compile a list (Punch List) of incomplete or incorrect items during the Substantial Completion Inspection, incorporate lists from all parties in attendance, and distribute list to all parties within 1 day of the Inspection.

1.18. If Substantial Completion is rejected:

A. Require the Contractor to have no more than 7 days to correct deficiencies indicated in the Punch List and request a subsequent Substantial Completion Inspection.

1.19. If Substantial Completion is accepted:

A. Require the Contractor to have no more than 30 days to correct deficiencies indicated in the Punch List and achieve Final Completion.

B. Require the Contractor to provide a copy of the latest MLGW utility bill for the Project related account, and a letter from the Contractor to MLGW requesting account transfer to the CofM, the CofM will then assume the cost of MLGW utilities at the time of successful account transfer.

NOTES

1.20. Require the Contractor to request Final Completion Inspection only upon correction of deficiencies indicated in the Punch List.

1.21. Require the Contractor to be present at the Final Completion Inspection. Major subcontractors shall be present on an as-needed basis.

1.22. Require the Contractor to compile a Final Punch List of incomplete or incorrect items during the Final Completion Inspection, incorporate lists from all parties in attendance, and distribute list to all parties within 1 day of the Inspection.

1.23. If Final Completion is rejected:

A. Require the Contractor to have no more than 7 days to correct deficiencies indicated in the Final Punch List and request a subsequent Final Completion Inspection.

1.24. If Final Completion is accepted:

A. Require the Contractor to have no more than 14 days from receipt of the Certificate of Final Completion to deliver all project closeout materials and inventory to the Consultant.

1.25. Require the Contractor to provide closeout materials including 2 complete hardcopy sets of original manufacturer documentation, submittals, manuals, and operations books clearly identified and smartly organized in boxes sequentially numbered and indexed; and 1 USB drive with the same materials in electronic PDF format. Samples of building materials are not to be included.

1.26. Require the Contractor to coordinate extra parts, physical material inventory, tools, etc with the CofM Project Manager for location and time of delivery.

1.27. Require the Contractor to provide closeout materials, including but not limited to:

A. Permits issued by the Authorities Having Jurisdiction,

B. Certificate of Substantial Completion,

C. Warranty documents,

D. Operation and Maintenance (O&M) manuals,

E. List of routine maintenance schedule and instructions,

F. List of routine finishes cleaning methods, schedule, and instructions,

G. Video of all systems demonstrations and operational recommendations clearly explaining all systems in their entirety. Video shall include actual dates for warranty termination, who to contact for warranty repairs, a detailed description of warranty covered items, and the manufacturer’s recommended preventive maintenance during and after the warranty period.

H. Manufacturer’s data and certificates,

I. All previous submittals,

J. Project Record documents (as-built conditions),

K. Extra parts, physical material inventory, tools, etc,

L. Contractor's Consent of Surety,

M. Contractor's Waivers of Lien.

N. Final Application for Payment identifying total adjusted contract sum, and previous payments.

1.28. Require if a final site survey is required (determined per project), the Contractor will be engaged per additional fee services in the contract language.

1.29. Require the Contractor to fully warranty 100% of the Work under his contract for 365 days from the date of Substantial Completion, Certificate of Occupancy, or Final Punch List completion, whichever is latest. The Owner will submit warranty claims to the Contractor during the one year warranty period. Prior to the expiration of the warranty period the Contractor will attend an 11-month walk-through to inspect the Work. Contractor shall provide full repair or replacement to the Owner's satisfaction at no expense to the Owner.

1.30. Require the Contractor (and as-needed key team members) to attend a 1-year design and construction review and post occupancy evaluation of the Project for the Design for Discovery phase of this Design Directive. This will be separate from the 1-year warranty period walk-through.

1.31. Include the standard CofM Project Sign as directed by the City Engineering department, and the standard CofM Building Dedication Wall Plaque as directed by the CofM Project Manager in the Construction Documents. Wording on signage shall be coordinated with the CofM Project Manager.

1.32. Include warranty terminology to notify the Contractor to guarantee HVAC work past the 1-year warranty period per the following:

A. Heating Work (including all piping, equipment, controls, and ductwork): One complete heating season extending from October 16 through April 15, or for one year, whichever is the greater. If substantial completion of the installation is made at any time during the heating season, then the warranty shall extend through the entire following heating season.

B. Cooling Work (including all piping, equipment, controls, and ductwork): One complete cooling season extending from April 16 through October 15, or for one year, whichever is the greater. If substantial completion of the installation is made at any time during the cooling season, then the warranty shall extend through the entire following cooling season.

C. Loss of refrigerant or lubricant shall be considered as a defect in workmanship and shall be included in the guarantee.

D. All compressorized equipment shall be guaranteed (material and labor) against failure for an additional period of four (4) years, including loss of refrigerant and oil.

NOTES

13

material specifications

NOTES

Items in this section provide the Consultant with additional direction pertaining to material specification required in the Drawings and/or Specifications, and is organized by the 50-Division MasterFormat components. It is the Consultants responsibility to coordinate these items with sub-consultants.

Within Various Divisions, the Consultant shall include the following direction where applicable:

1. The Contractor shall coordinate, supply, and install all access panels as required to allow maintenance and replacement access to all concealed equipment. Access panels shall be flush/recessed in gypsum wall/ceiling assemblies. Location, size, and style of all access panels shall be submitted to the Consultant as a shop drawing for approval.

2. Blocking and securing for all wall hung equipment and accessories is the responsibility of the Contractor. All instances of equipment or accessories shall be secured firmly with safety, vandal-resistant fasteners and anchors.

3. The Contractor shall construct the appropriate mockups as required of the Project.

Within Division 2 - Existing Conditions, the Consultant shall include the following direction where applicable:

2.1. The Contractor shall not remove any cut-stone curbs from downtown locations without written permission from the CofM Project Manager. All relocated cut stone shall be stacked and separated on pallets to prevent breakage during handing and transportation. Loaded pallets of cut-stone curbs shall be wrapped in plastic to prevent water intrusion during transportation and extended storage. The Contractor shall coordinate delivery location for excess cut-stone curbs with the CofM Project Manager.

Within Division 3 - Concrete, the Consultant shall include the following direction where applicable:

3.1. All slabs-on-grade shall have a class-A, deterioration-resistant vapor retarder with a minimum thickness of 10 mils. Vapor retarder shall be free of any punctures, tears, open seams, or other disruptions to the function of the barrier, when concrete is placed. Vapor retarder shall be continuous under foundations and footings as well as slabs.

3.2. Concrete formwork accessories, including anchors, expansion joints, control joints, and water stops, shall be from 1 manufacturer where possible. Contractor shall be required to notify Consultant

prior to concrete pours, to allow Consultant to observe vapor retarder, formwork, reinforcing, embedded bases, anchor bolts, and block-outs.

NOTES

3.3. Concrete mock-ups shall be required for interior and exterior concrete (including sidewalks) for Owner approval of finish, quality of installation, and expectation of subsequent installation. Size shall be 5’ x 10’ minimum and to depth specified. Mock-up may be allowed to become a part of the project if all parties agree.

3.4. Include minimum 4000psi / 4” thick concrete design for all cast-in-place, slab-on-grade concrete. Areas with dumpster pads and aprons shall be 8” thick and extend 30’ past the front of the dumpster enclosure. Include a minimum of fiber mesh reinforcement at all exterior concrete. Use carbon-reduction methods where possible.

Within Division 4 - Masonry, the Consultant shall include the following direction where applicable:

4.1. All current standards for masonry materials and shall be adhered to, including quality assurance, compliance, and testing for grouts, mortars, masonry units, and installation.

4.2. Masonry grout compressive strength shall match masonry units, but not be less than 2000 psi.

4.3. Damaged masonry shall be carefully removed and replaced with matching, undamaged units using mortar. Mortar color shall match original work. Remove masonry units back to full block / brick as required to match and blend in with original placement.

4.4. Re-pointing of masonry shall be removed and replaced with fresh mortar, filling each joint completely and tooling to match adjacent work.

4.5. Masonry cleaning by hand of drips, splatters, and stains shall be required of all masonry work.

4.6. Do not use glass masonry units (glass block), stone or stone veneer, simulated masonry (thin brick), or exterior insulation ans finish systems (EIFS) without written acceptance from the COM Project Manager.

Within Division 5 - Metals, the Consultant shall include the following direction where applicable:

5.1. Design non-load bearing, light gauge, metal stud framing to include minimum 6” metal studs at exterior conditions, and 3-5/8” or 4” metal studs at interior conditions. Assemblies shall include minimum 5/8” thick gypsum board at all locations. Use “Type-X” at rated locations, “MR - moisture resistant” at damp locations, and “Durock” cement board or “Dens-Shield” at all ceramic tile and wet locations.

Within Division 7 - Thermal and Moisture Protection, the Consultant shall include the following direction where applicable:

7.1. All access ladders (roofs, pits, equipment mezzanines) shall be vandal resistant and located in secure and controlled areas.

7.2. All instances of dampproofing and waterproofing must be installed by manufacturer-certified personnel. The Contractor shall supply proof of proper certifications to the CofM Project Manager.

NOTES

7.3. The minimum thermal insulation requirements for all construction, new and renovation/restoration, is the current code requirement for new construction plus 10%.

7.4. General roofing specifications shall address the following:

A. All roofing assemblies shall meet FMGlobal.com, ROOFNAV assemblies specifications. The roofing design must be approved by FMGlobal prior to bidding. Contractor shall present roof assembly shop drawings to FMGlobal for approval prior to ordering materials and commencing work.

B. Prior to ordering materials and commencing work, the Contractor shall request a pre-construction roofing conference with the Consultant, Contractor, Roofing Subcontractor, CofM Project Manager, and CofM Property Maintenance department to address all roof assembly issues including construction details, installation, warranty, testing, and final acceptance procedures.

C. Submittals and shop drawings for roof assemblies shall include complete technical data and actual product physical samples of the material proposed for use shall be forwarded to the Consultant for written approval prior to delivery of any material to the job site. All roofs shall be tested prior to acceptance by the City of Memphis.

D. The roofing contractor and all technicians shall have at least five (5) years experience installing the specified roofing products.

E. The roofing contractor shall be responsible for taking all necessary measurements to verify the dimensions indicated on the project drawings.

F. Roof assembly warranties shall start at the time of final acceptance. The manufacturer shall provide a thirty-year replacement warranty. The roofing contractor shall provide a written five (5) year Workmanship No Dollar Limit (NDL) warranty. Warranties shall include all labor & materials costs, have an unlimited penal sum, and the workmanship warranty shall provide a minimum 48-hour response time.

G. No manufacturer substitutions shall be allowed.

7.5. No flat roofs will be allowed. If a low-slope roof is approved by the CofM Project Manager, the minimum slope shall be 1/2” per foot. Slope shall be achieved by structural system and decking, not by insulation board.

7.6. Shingle roof assembly specifications shall address the following:

A. Composition shingles shall be fiberglass based asphalt shingles conforming to Federal Specifications SS-S 001534, Class A, Type 1, and ASTM D-4362-87, Underwriter’s Laboratory as Class A-Fire Resistant and Wind Resistant, and be certified algae resistant.

B. Asphalt coated underlayment shall be one layer of 30 pound organic felt, 36” wide and conforming to ASTM D-226-81, minimum 6/12 slope, surface roll roofing shall be 36” wide, 90 pounds or heavier, and supplied by the shingle manufacturer. Roll roofing shall be used as closed valley flashing. Fasteners shall be nails and shall conform to the roofing manufacturer’s

requirements for material, shape and installation placement. Roof brackets shall be used; nailing walk boards onto shingles will not be allowed.

C. Acceptable manufactures and products include Tamko “Heritage”, Owens Corning “Oak Ridge”, CertainTeed “Landmark”, and GAF “Timberline”

D. Shingle roofs shall be tested by placing oscillating sprinklers along the roof ridge in sufficient numbers to cover all areas of the roof with water for a period of no less than three (3) hours. The Contractor shall repair all leaks discovered by these procedures prior to substantial completion.

7.7. Metal roof assembly specifications shall address the following:

A. Metal roofing systems shall be standing seam panels with seams at a minimum of 1-1/2’ high, spaced a maximum of 16-1/2’ on center. Panels shall be continuous length from ridge to eave. Each seam shall have an extruded vinyl insert for a watertight seal. Continuous underlayment shall be “Ice and Water Shield” or as recommended by the manufacturer.

B. Acceptable manufactures and products include Berridge “Cee-Lock”, and Peterson “Snap-Clad”.

C. Standing seam metal roofs shall be tested by placing oscillating sprinklers along the ridge in sufficient numbers to cover all areas of the roof with water for a period of no less than three (3) hours. The Contractor shall repair all leaks discovered by these procedures prior to substantial completion.

7.8. Modified Bitumen (Mod-Bit) roof assembly specifications shall address the following:

A. Mod-Bit roofing systems shall consist of base sheets plus cap sheets per the selected manufacturers system. Cap sheets are preferred to be light colors to minimize heat absorption.

B. Accessory components are to be from the same roofing manufacturer as the roofing or as per roofing manufacturer recommendations to maintain warranty. Accessories include flashing, caps, boot, anchors, scuppers, etc.

C. Acceptable manufactures and products include Tamko Asphalt Products, CertainTeed Systems, and Soprema Roofing Systems.

D. Mod-bit roofs shall be tested by plugging roof drains, flooding roof to a minimum depth of 2 inches above the drain clamp ring. (At no time shall the water level rise as high as 2 inches below the top of any flashings, pitch pockets, curbs, equipment, top of any vent or stack, or any other facility that may be damaged from this test). Water shall remain for a period of two (2) hours. Each roof drain shall then be allowed to drain its area one area at a time until the entire roof is drained. The Contractor shall repair all leaks, areas of slow drainage, and/or areas of standing water after drainage which is discovered by these procedures prior to substantial completion.

7.9. Thermoplastic Polyolefin (TPO) roof assembly specifications shall address the following:

NOTES

A. TPO roofing assemblies shall be approved for use by the CofM Project Manager, and per the additional maintenance agreement requirements noted below.

B. TPO roofing assemblies must be 80 mil. thickness. 60 mil. may be used upon approval of the CofM Project Manager if warranty requirements can be met.

C. Accessory components are to be from the same roofing manufacturer as the roofing or as per roofing manufacturer recommendations to maintain warranty. Accessories include flashing, caps, boot, anchors, scuppers, etc.

D. Acceptable manufactures and products include Carlisle Roofing Systems “Syn-Tec”, GAF “Everguard”, and Firestone Building Products”Ultra-Ply Platinum”.

E. TPO roofs shall be tested by plugging roof drains, flooding roof to a minimum depth of 2 inches above the drain clamp ring. (At no time shall the water level rise as high as 2 inches below the top of any flashings, pipe boots, curbs, equipment, top of any vent or stack, or any other facility element that may be damaged from this test). Water shall remain for a period of two (2) hours. Each roof drain shall then be allowed to drain its area one area at a time until the entire roof is drained. The Contractor shall repair all leaks, areas of slow drainage, and/or areas of standing water after drainage which is discovered by these procedures prior to substantial completion.

7.10. Downspouts shall not drain across sidewalks.

7.11. Do not use glass masonry units (glass block), stone or stone veneer, simulated masonry (thin brick), or exterior insulation ans finish systems (EIFS) without written acceptance from the COM Project Manager.

Within Division 8 - Openings, the Consultant shall include the following direction where applicable:

8.1. Hollow metal doors and frames shall be fabricated in a single manufacturer’s shop. Eliminate or minimize the amount of field fabrication on all doors, windows and store front framing. Doors and frames shall be primed by the manufacturer. Where possible, doors and frames shall be painted by the manufacturer. All exterior doors shall be metal with minimum view light. Interior doors shall be solid core wood.

8.2. Automatic doors shall be multipurpose, push button, electrically operated with manual push / pull over-ride, and fully ADA accessible.

8.3. Corner wheel guards or steel bollards (concrete filled) shall be included at all overhead door jambs (both sides of doors).

8.4. All door hardware is to be Corbin/Russwin (C/R) of the following specifications, with no substitutions:

A. Mechanical Cylindrical Lever Sets: C/R CL3300/NZD series

B. Mechanical Mortise Locksets & Latches: C/R ML2000 series

C. Auxiliary Padlocks: C/R PL5000 series

D. Exit Devices:C/R ED500 - equip exit devices with keyed devices (cylinder dogging)

NOTES

E. Fire-Rated Door Exit Devices: C/R ED5600A1 w/ Keyed Trim Pack

F. Overhead Closers: C/R DC6210 (adjustable spring pressure)

G. Cylinders:C/R L-4 Keyway 6-Pin (no interchangeable cores)

8.5. Typical door hardware specifications shall include:

A. Match existing master key systems specific to each project. Construction locks: choose one of the following strategies:

I. Temporary cylinder for construction period

II. Temporary construction keying to be automatically verified through the use of Owner's keys City of Memphis Property Maintenance will provide three (3) change keys for each lock, plus five (5) master keys for each master key system. Stamp keys "DO NOT DUPLICATE" (omit notation for one key per group).

III. Specify that the GC is to provide key control system, including metal cabinet with 150% capacity, envelopes, labels, tags, clips, forms, card index, and markers (standard system).

8.6. The glazing contractor and all technicians shall have at least five (5) years experience installing the specified glazing products.

8.7. Do not use skylights or roof windows with the written permission of the CofM Project Manager.

8.8. Design glazing systems to be location specific with consideration to higher thermal values than required by code. Glazing shall be laminated, shatter-proof glass.

Within Division 9 - Finishes, the Consultant shall include the following direction where applicable:

9.1. General painting specifications shall address the following:

A. Contractor shall notify Property Maintenance in advance of application dates. Property Maintenance shall inspect each coat of primer and finish.

B. Doors shall be finished on both faces and all four (4) edges.

C. Surfaces shall be lightly sanded before each successive coat.

D. Concrete and masonry shall have block filler applied to ensure complete coverage with all pores filled.

E. Exterior ferrous metal shall have one (1) coat rust inhibitive primer and two (2) finish coats.

F. Exterior galvanized metal shall have one (1) coat galvanized primer and two (2) finish coats.

G. Exterior aluminum surfaces shall have one (1) coat acrylic or alkyd-base primer, and two (2) finish coats.

H. Interior ferrous metal shall have one (1) coat of rust inhibitive primer, one (1) coat enamel undercoat and one (1) finish coat.

I. Interior aluminum shall have (1) coat galvanized metal primer and two (2) finish coats.

J. Interior stained woodwork shall have filler coat, stain coat, sealer coat and two (2) finish coats.

K. Exposed steel in swimming pool areas shall have primer with Tnemec series 135, and two (2) finish coats.

L. Acceptable paint manufacturers may include Farrell-Calhoun, Glidden, Benjamin Moore, PPG, and Sherwin-Williams.

9.2. All kitchen, pantry, and food preparation areas shall include wall and corner protection, such as fiberglass reinforced panels (FRP). Dish washing and mop sink areas shall include aluminum or stainless steel wall sheets (min 4' tall) around the splash area.

Within Division 10 - Specialties, the Consultant shall include the following direction where applicable:

10.1. Include solid polymer toilet compartments / partitions with stainless steel door hardware. All dividers shall have "full length" wall mounted two ear brackets (front and back) with "grip resistant" caps. Pilasters shall attach to floor with concrete anchors using manufacturer's mounting package for proper shoe, and secure at the top with a common grip resistant head rail attached to both end wall supports.

10.2. Standard toilet accessories shall include electric hand dryers, baby changing stations, and vandal-resistant mirrors. Other accessories shall be coordinated with the CofM Project Manager and User. All instances shall be secured firmly with safety, vandal-resistant fasteners and anchors into wall blocking (provided by the Contractor).

10.3. Include the Standard CofM building identification signage within and around projects. Coordinate design and wording with the Owner for specific requirements. Interior signage design and installation shall be coordinated with the CofM Project Manager.

10.4. Flag poles shall be 30' tall rated to withstand 110 mph wind, external halyard, and rope cleat shall be covered and locked with a padlock. Padlock and flag to be provided by the Owner. Lighting, controlled by photocell, shall be provided to illuminate the flag.

Within Division 11 - Equipment, the Consultant shall include the following direction where applicable:

11.1. The Consultant shall coordinate any Owner Furnished equipment or products with the CofM Project Manager and indicate within the Construction Documents.

Within Division 21 - Fire Suppression, the Consultant shall include the following direction where applicable:

21.1. The Contractor shall provide a fully operational building fire protection system via delegated design with licensed and certified fire protection subcontractors, so the satisfaction of the local and state Fire Marshal.

21.2. Upon completion of the Fire Protection System and prior to the acceptance of the installation, subject the system to the tests

required by the local code and NFPA Pamphlet No. 13. Furnish the Architect with a certificate as required by NFPA.

NOTES

21.3. All new CofM projects shall include an automatic sprinkler system. All renovation projects shall include an automatic sprinkler system if the total renovation cost is more than 50% of the original total building cost. The Consultant shall coordinate renovation projects with the CofM Project Manager.

Within Division 22 - Plumbing, the Consultant shall include the following direction where applicable:

22.1. Soil, waste and vent piping shall be tested by plugging all openings and testing in 10 psi sections with water. Test shall be maintained for not less than 15 minutes.

22.2. Roof drain piping shall be tested same as specified for soil, waste and vent piping. Roof drain piping that daylights above finish grade shall not drain across sidewalks.

22.3. Domestic water piping shall be thoroughly cleaned, pressure tested and proven tight with minimum 100 lbs. hydrostatic pressure. Test of interior piping shall be made prior to setting of fixtures. Complete system sterilization shall be provided as required by code.

22.4. The domestic water system shall be disinfected as follows: The system shall be filled with a solution containing 100 parts per million of available chlorine and allowed to stand 2 hours before flushing and returning to service.

22.5. Disinfecting of cast iron water main shall be in accordance with AWWA C 601-68 latest revision.

22.6. All valves, strainers, fittings, etc., shall be insulated. This requirement may be deleted from hot water piping, steam piping, steam traps and steam condensate return piping subject to prior written approval from the City.

22.7. Premolded fittings matching basic pipe insulation shall be provided at all pipe fittings and finished with glass fabric and vapor barrier mastic where required. Glass fiber blanket inserts with plastic covers are not acceptable for pipe fitting insulation.

22.8. Piping installed in areas subject to freezing shall be heat traced and insulated. Heat tracing shall be self-regulated and shall be sized to maintain piping surface temperature of 40° F at 0° F ambient temperature. Water piping exposed to weather conditions shall be provided with weatherproof insulation and jacket.

22.9. Soil, waste and vent piping and fittings inside the building and above grade shall be cast iron.

22.10. Building sewer piping and fittings 5’-0” from building shall be PVC plastic pipe D-3033 or D-3034 SDR 26 shall be joined using rubber seals complying with ASTM D-1869 or schedule 40 PVC with solvent joints. Where cast iron sewer piping is connected to PVC with rubber coupling, the joint should be encased in concrete, the encasement should cover 12’ of PVC and 12’ of cast iron.

22.11. Storm drainage piping and fittings outside building may be PVC sewer pipe conforming to ASTM D-3033 or D 3034.

NOTES

22.12. Trenches and ditches in which any type of plumbing piping is placed, shall be compacted during backfilling. Contractor shall provide the services of site engineer of record or an independent testing agency to monitor the backfill and compact and certify that it has been completed to specification.

22.13. Domestic hot and cold water piping shall be Type “L” hard drawn copper with wrought copper fittings above ground. Type “L” copper shall be installed with “Lead Free” 95.5% tin, 4.5% copper and .5% silver solder and non-corrosive flux. Pressed joint fittings may be used with written approval from the CofM Project Manager.

22.14. Water lines installed underground shall be Type “K” copper with wrought copper fittings and lead-free solder joints. Type “K” copper shall be installed with “Sil-Foss” brazing alloy with melting temperature in excess of 1100 degrees F. Contractor shall minimize the number of fittings below grade. Buried pipe shall be coated with two coats of asphaltum with glass cloth embedded after first coat.

22.15. Water lines 3” and larger outside of building or permanent structures shall be AWWA Bell & Spigot cement lined ductile iron (250 lb. Class) with a coat of black asphaltum or shall be class 150 PVC pressure pipe manufactured with integral bell section and using a solid cross section rubber ring. It shall meet ASTM D-2241, except that the OD’s shall be cast iron size, and also meet AWWA C-900-75. Each length, including the bell section, shall be tested to four times the class of the pipe. The SDR shall be 18. The pipe shall be Underwriters Laboratory accepted. Fittings shall be ductile iron with mechanical joints.

22.16. Water lines less than 3” outside of the building or permanent structure shall be PVC pipe Schedule 40 complying with ASTM D 2241 with solvent welding joints with ASTM D 2564 cement. All materials shall bear NSF seal on pipe and cement container.

22.17. All water piping from 5’-0” outside of the building to service rise shall be ductile iron, copper or brass.

22.18. In renovations where natural gas already exists in the project, revisions or additions to natural gas piping shall be schedule 40 black steel pipe.

22.19. Condensate drain pipe shall be type “M” copper with DWV fittings or PVC DWV pipe with PVC DWV fittings.

22.20. Air piping shall be Schedule 40 black steel, with screwed black malleable fittings. Aluminum air piping may be used with written approval from the CofM Project Manager.

22.21. In seasonal buildings all water piping shall be installed to allow complete drainage and freeze protection of system. Provide low point drains as required.

22.22. All water lines shall be installed in interior walls where possible but in no case shall a water line be installed in an exterior wall with a northern exposure.

22.23. Water lines 2” and larger shall have thrust blocks installed at all branches 45 degree elbows, and 90 degree elbows.

NOTES

22.24. Reduced pressure back flow preventers shall be Watts Series 909 without substitution. Units 2-1/2” and under shall be installed with strainer, ball valves and unions on each side of device for easy removal. Units 3” and larger shall be flanged. All piping including risers on both side of units shall be copper, brass, galvanized or ductile iron.

22.25. Property Maintenance shall be provided with a copy of plumbing permit and also a copy of test report within 10 days of receipt.

22.26. Flow switches and relay at centrifugal pumps shall be manufactured by Flowline.

22.27. Water filters shall be included for all appliances that provide potable water.

22.28. All heat trace cable provided for freeze protection shall be self regulating type.

22.29. All storm drainage piping and systems shall be cleared of all CRT, cement or other joints materials, debris, and extraneous materials of every description. For small diameter pipe where cleaning after laying may be difficult, a squeegee shall be kept in the pipe line and pulled forward past each joint immediately after its completion. The contractor shall flush all lines with clean water, prior to final inspection to assure complete removal of all debris and foreign material. A water test shall be applied to the drainage system either in its entirety or in sections.

22.30. The drainage system or any part thereof shall not be covered until it has been water-tested, inspected, and approved. Test water shall remain in pipe for a minimum of two consecutive hours after backfill to inspect for leaks caused by backfilling.

22.31. Flush valves for water closets and urinals shall be Sloan No. 110 & 186 without exceptions.

22.32. Faucets for lavatories shall be Kohler, Moen, Delta or American Standard.

22.33. No flush tank water closets shall be installed except in special conditions as approved by the Project Manager and Property Maintenance.

22.34. Water closets shall be wall hung elongated bowls with chair carriers. Carriers shall be “heavy duty” and include rod support feet.

22.35. Wall hung lavatories shall have concealed arms and chair carriers.

22.36. CofM Project Manager and Property Maintenance shall be notified of any installation and any testing of plumbing fixtures and systems 24 hours in advance of covering pipes.

22.37. All water piping shall be installed so that it may be winterized and drained down. Low point drains shall be installed.

22.38. No garbage disposals to be installed unless approved by the CofM Project Manager and Property Maintenance.

22.39. Caulk joints between wall and fixture at wall mounted lavatories, water closets, urinals, drinking fountains and service sinks with white silicone sealant.

NOTES

22.40. All valves, waste and water supply piping servicing fixtures exposed beyond face of finished walls shall be chromium plated brass, where fixtures are mounted in counter tops and cabinet work concealing valves and piping, chrome plated brass finishes are not required.

22.41. Where flush valves are specified with fixtures, supply to valve in each room shall be at same height for that type of fixture, and valve shall be set in place so that center line of valve discharge is directly above center line of fixture spud. Bending of nipple between valve and spud to achieve connection will not be permitted.

22.42. All brackets, cleats, plates, anchors, etc., required to support fixtures or piping rigidly in place shall be provided as work of this section and shall be installed behind finished walls.

22.43. Provide and install basic fixtures from one major fixture manufacturer. Also, accessories such as faucets, strainers, stops, traps, etc. shall be manufactured by one major company where possible.

22.44. All equipment shall be equipped with a secondary drain pan piped to an interior sanitary sewer drain line. In areas such as museum, storage areas, and gyms where undetected water leaks are critical - all secondary pans shall be equipped with electronic water sensing devices with an alarm signal wired into the office of the facility.

22.45. Provide chrome plated metal escutcheons, of the proper size, with fastening devices, on all pipes passing through finished wall surfaces and finished ceiling surfaces.

22.46. A shutoff valve shall be installed in each connection to each piece of equipment and valves shall be located such that the equipment may be serviced or removed and replaced without shutdown of the general piping system. Shutoff valves shall also be installed in branch lines to risers dropping in walls, partitions, or chases.

Within Division 23 - HVAC, the Consultant shall include the following direction where applicable:

23.1. All mechanical equipment given an identification number or letter on drawings shall be so identified on the project by the Contractor. The identification number shall be in a visible location on the piece of equipment. Exterior equipment shall have the identification permanently engraved, embossed, or such on permanent plates permanently fixed (no screws or such) to the equipment. Interior equipment may have identification permanently painted on the face of the equipment. (i.e. Air Handling Unit #AHU-1 shall have “AHU-1” stenciled on it.) The letters and numbers shall be a minimum of 2” high on larger pieces of equipment such as air handlers, make-up air units, etc. The stenciling letters and numbers on smaller pieces of equipment such as heat pumps, VAV boxes, exhaust fans, pumps, unit heaters, etc., may be reduced in size. Mechanical equipment located above suspended ceiling shall also have the identification number placed on the ceiling grid in vinyl non peel off labels or characters smaller than the face of the grid.

NOTES

23.2. All major control and sectionalized valves shall be identified as to its function and system number. The designation on the valve tag shall correspond to the designation shown on the valve chart which is to be prepared and submitted to the Owner at the end of the project. Valve tags shall be a minimum of 2” in diameter, nonferrous minimum 16 gauge metal, with stamped letter indicating the service. Secure the tags to the valve with key chain or approved equal. Identify automatic control system components as for valves. Identification shall be coordinated with control diagrams and panels.

23.3. All piping shall be identified with color pipe bands, identification labels and flow arrows. Pipes shall be banded and labeled on 10’-0” centers on continuous lines, at equipment connections at each valve, at both sides of a wall through which pipe passes, at every branch connection, at each riser and on piping within sight of an access door on panel. Show flow direction arrows at each identification point. Pipe identification shall be by the scheme as called for by ANSI A13.1. Pipe identification may use pressure sensitive labels as manufactured by Allstate, W. H. Brady, Emed Co. or Seton. Labels and flow arrows shall be 1” high on pipe sizes up to 2 ½”, and 2” high on pipe sizes of 3” and larger. Bands shall be 1-1/2” wide. Bands and labels shall have flow arrows at the same location. Stenciling or labeling shall be color coded according to ANSI A131. Pipe lines in areas where letters and arrows cannot be installed shall have stencil identification installed on metal panels, in the proper color to agree with the color of identification. Panels shall be of 16 gauge steel hung to the pipe with key chains. Provide 4” wide plastic tape marker over center line of all underground piping in all earth trenches 12” below grade.

23.4. Label all thermostats, indicating which piece of equipment they operate.

23.5. HVAC testing shall be completed according to any applicable codes or governing authorities, and in the presence of the Project Manager or his/her designer. The tests shall be made in the presence of the City representative. The Contractor shall notify the City in writing, at least 72 hours prior to testing of any mechanical system, and shall submit within 24 hours copies of any test result to the City Consultant.

23.6. Testing shall be completed according to manufacturer’s requirements as applicable or in the absence of such requirements, as described herein.

23.7. Upon completion of any portions of the work, the piping and ductwork systems shall be cleaned and tested as described here and any defects discovered shall be corrected before applying any covering to piping or ductwork and prior to final inspection.

23.8. Water piping shall be thoroughly cleaned, pressure tested and proven tight with minimum 100 lbs. hydrostatic pressure for eight hours without drop in pressure.

23.9. Steam and condensate return piping shall be thoroughly cleaned, pressure tested, and proved tight with hydrostatic pressure of 100 psi or 150 percent of system operating pressure, whichever is highest.

23.10. Refrigerant piping shall be tested and proven tight with 250 lb. test anhydrous carbon dioxide, then all lines shall be evacuated with a vacuum of 28 inches of mercury and held without loss for a period of 24 hours.

NOTES

23.11. In renovations where natural gas already exists in the project, revisions or additions to natural gas piping shall be tested and proven tight with 100 lbs. air pressure or as recommended by gas utility supplier. Compressed air piping shall be tested and proven tight with 125 lbs. air pressure.

23.12. All medium pressure and high pressure ductwork shall be tested at 1.5 times the operating pressure of the system to which it is connected, or at the total fan static pressure, whichever is greater.

23.13. All audible air leaks shall be repaired. Ductwork shall be tested for leaks before applying external insulation and before concealing in inaccessible locations.

23.14. Upon completion of the installation of all work and equipment, the Contractor shall start all equipment and make all necessary adjustments to place entire HVAC systems in a satisfactory condition for continuous safe operation.

23.15. All throw-away filters shall be replaced with the specified type after the period of adjustment.

23.16. Air circulation systems shall be cleaned free of all dirt and debris and adjusted to provide uniform heating and/or cooling of all spaces served by each system. Test adjustments shall be continued until uniform temperature within conditioned areas has been attained within two (2) DegF for one (1) DegF above and below thermostatic setting.

23.17. Lubricate all bearings of equipment furnished using only lubricant recommended by manufacturer of such equipment. Tag each piece of equipment with date of lubrication, with subcontractor's name imprinted thereon. Bearings shall be left in cool, trouble free, operating condition.

23.18. Temperature and safety controls shall be adjusted as necessary to insure continuous, trouble free, safe, and automatic operation of systems including boiler, gas burner, refrigerating equipment, etc.

23.19. Products furnished for City projects shall be manufactured by manufacturers regularly engaged in manufacture of similar items and with a minimum of five (5) years of production of the specified product.

23.20. All equipment and devices shall bear the manufacturer's nameplate, giving name of manufacturer, description, size, type, model number, serial number, electrical characteristics, etc. in order to facilitate future maintenance or replacement.

23.21. Welding shall conform to ANSI Code for Pressure Piping, Section B31.1. All welds shall be of the single "V" butt joint type with optimum fusion and 100% weld penetration of wall-thickness of piping. A certificate shall be provided by the contractor indicating certification of all pipe welders on the project, in accordance with Section IX if the ASME Code.

23.22. Refrigerant piping shall be sized and arranged in accordance with the compressor manufacturer's recommendations for proper pressure drops and oil return. Suction line pressure

drops shall not exceed 3 PSI from a point located at the end of evaporator and the beginning of the suction line to a point to entering the compressor.

NOTES

23.23. In renovations where natural gas already exists in the project, flex connectors shall not be used to connect heating appliances to the gas supply lines where revisions or additions are required. All appliances shall be connected with rigid piping.

23.24. Ahead of each expansion valve and/or solenoid valve provide a filter-dryer and a moisture indicator.

23.25. A/C Condensate Drain piping shall have DWV fittings with 1-1/4" minimum size. Use combination wye and l/8 bend with clean out plug at each change in direction.

23.26. All piping and ductwork shall be insulated in accordance with adopted codes and local amendments including:

A. Domestic cold, hot, and hot water return piping.

B. All horizontal roof drain piping.

C. Refrigerant suction and hot gas lines.

D. Space heating and chilled water piping.

E. Steam and condensate return piping.

F. Condensate water piping when water side economizer is designed.

G. Makeup water and condensate drain lines.

23.27. All supply and return conditioned air ductwork in unconditioned spaces will be insulated. Also, surfaces of equipment and/or devices in the air conditioning system subject to condensation shall be insulated.

23.28. Ductwork and plenums within the equipment room and where subject to damage shall be insulated with duct board insulation.

23.29. Other equipment to be insulated includes:

A. Converts.

B. Air separators (hot and chilled water).

C. Domestic water heaters/storage tanks (when not factory insulated).

D. Condensate receiver tanks and boiler feed water receiver tanks (when not factory insulated).

E. Compression tank (chilled water).

F. Pumps (chilled and free cooling condenser water).

G. Chiller evaporators.

23.30. Contractor shall place, permanently mounted, a copy of as-built drawings on the wall in the mechanical room(s) of the facility. As-built drawings shall include schematics clearly identifying the system design, operating sequence, component location, shaded

and numbered area affected by each VAV and/or FTU, contractor, and date. As-built drawings shall be covered with clear and washable surface.

23.31. Exact location of VAV boxes, FTUs, and all controls including static pressure controls shall be marked on ceiling of facility by tack or other means that shall not overly detract from overall appearance of facility. Additionally, all controls shall be positioned so as to be readily accessible to maintenance personnel upon completion of the project. All static pressure controls shall receive particular attention in this regard.

23.32. Ductwork shall be constructed from Galvanized steel ASTM A525-75 Grade G90, hot dip galvanized to 0.90 oz. of zinc per square foot of metal, or “Utility grade” aluminum sheets ASTM B-209-76.

23.33. Where ends of duct abut other insulation or lined metal ducts, seal the vapor jacket to the adjacent surface with permanent adhesive. Do not use “duct-tape.”

23.34. The HVAC testing and balancing contractor shall be an independent agency who shall be a member of the Associated Air Balances council (AABC) or National Environmental Balance Bureau (NEBB).

23.35. Final inspection of work shall be made when records and reports have been certified and submitted which show that all mechanical equipment and systems have been balanced and performance tested under the direction of a qualified engineer to meet all design

23.36. All systems shall be adjusted and balanced as required to deliver the specified quantities within plus or minus five (5) percent.

23.37. Final copies of the test and balance data shall be included in the O&M Manuals.

23.38. In renovations where natural gas already exists in the project, revisions or additions to natural gas piping hall require all seismic gas valves shall conform to:

A. Pacific Seismic/California valves.

B. Valves shall not require electricity or any external power source to operate.

C. Valves shall remain closed until manually reset and must be able to be reset in the field without removal.

D. Valves shall be mounted in the gas line downstream of the meter and pressure regulator.

E. Pressure gauges shall be installed before and after the seismic valve.

F. Valves shall be swing check style with an acceleration-sensitive triggering mechanism.

23.39. The Contractor shall supply and install all access panels as required to allow maintenance and replacement access to all concealed equipment.

Within Division 26 - Electrical, the Consultant shall include the following direction where applicable:

NOTES

26.1. The Contractor is to provide the infrastructure (empty conduit with pull strings or cable trays) for all interior and exterior low-voltage wiring required in projects. This may include telephones, data networks, fiber optic connection, access controls, security cameras, and public address systems.

26.2. The Contractor shall supply and install all access panels as required to allow maintenance and replacement access to all concealed equipment.

26.3. Blocking and securing for all wall hung equipment and accessories is the responsibility of the Contractor. All instances of equipment or accessories shall be secured firmly with safety, vandal-resistant fasteners and anchors.

Within Division 31 - Earthwork, the Consultant shall include the following direction where applicable:

31.1. The Contractor is responsible for achieving the required compaction of sub-grade materials. Soil that is only too wet (or too dry) will not be considered unsuitable material. Undercutting and backfilling, or processing and drying material are options for correcting unsuitable soils, but all costs associated with these activities are at the Contractors expense.

Within Division 32 - Exterior Improvements, the Consultant shall include the following direction where applicable:

32.1. The Consultant shall coordinate the need for an underground irrigation system with the CofM Project Manager. The use of native plant materials with no-irrigation or very low irrigation needs is preferred.

32.2. In the case a no-irrigation design is installed, the contractor shall include a landscape maintenance agreement to provide watering of plant materials during an establishment period, for at minimum of 2 years beginning from the date of Substantial Completion. Contractor shall include a calendar schedule indicating the proposed watering timeline to the Owner.

14

fire department

NOTES

The Memphis Fire Department provides fire suppression, rescue services, environmental and hazardous materials response, emergency medical response, emergency pre-hospital services, fire code enforcement, fire investigation, disaster preparedness training, and fire safety education. All City of Memphis Fire Department projects shall include the following items:

1. HVAC systems are to comply with the following:
    A. Design criteria for relative humidity levels in fire station sleeping quarters are of particular concern and are to follow ASHRAE recommendations. Architects and Mechanical Engineers are to meet with Fire Station Project Managers to discuss this issue in detail and follow directing accordingly.
    B. Special consideration shall be placed on fire station sleeping areas to reduce the likelihood of mold formation.
    C. Specify systems to be compatible with Allerton or Siemens controls and to be connected to the designated monitoring system.
2. Special attention to the design of the insulation envelope. Insulation shall be one layer.
3. New fueling stations are to be reviewed by the Fire Prevention Plan Review during the SD phase to determine minimum project-specific requirements for:
    A. Bollard design.
    B. Signage requirements.
    C. Emergency shut-off systems.
4. Electrical design/specification requirements:
    A. Electrical panel boards are to be the bolt-in type.
    B. GFCI and AFCI devices are to be located indoors. Exterior outlets are to be protected by GFCI devices located indoors.
    C. Electrical conduits installed under slabs are to be RMC, IMC, or rigid schedule 80 PVC.
5. Design/specification requirements for Site Pavement:
    A. Concrete pavement for fire apparatus use to be rated to support loads of 80,000 lbs.

B. Concrete pavement for vehicle traffic areas to be rated to support loads of 30,000 lbs.

C. Asphalt pavement installed in vehicle traffic areas to be rated to support loads of 20,000 lbs.

6. Design/specification requirements for kitchens:

   A. Kitchen sinks in fire facilities are to be equally sized double-bowl type and have a minimum depth of 8” on one side and 10” on the other side.

   B. Commercial stoves are to be fitted with locking casters to prevent stoves from being mis-aligned from overhead fire suppression systems.

7. Fire station entrances and spaces facing streets shall include the following:

   A. Glazing and walls shall be Level 3, bullet resistant, including metal framing and accessories / fixtures.

   B. Wall protection shall be Level 3 bullet resistant panels and UL-752 native equivalents such as ArmorTex, US Bullet Proofing, UHMWPE, or Fiberglass Well Armor.

8. Turning radiuses and clearances of firetrucks shall be verified and shown clearly on site plans for approval of the Fire Department Project Manager.

NOTES

15

general services

NOTES

Memphis General Services' is dedicated to it's mission of providing first-class maintenance and repair of buildings, vehicles, and other crucial support services. All City of Memphis General Services projects shall include the following items:

1. General Services requirements are applicable to all CofM projects and facilities and have been incorporated into Section 13 - Material Specifications.

NOTES

16

public libraries

NOTES

Memphis Public Libraries is dedicated to creating inviting and engaging public spaces that offer programs and resources for all Memphians and to bringing people of different life circumstances together in meaningful ways. All City of Memphis Public Libraries projects shall include the following items:

1. New libraries are to include a minimum of 15,000 sq. ft. of publicly accessible space. With the goal of achieving highly flexible public space, the design goal will be to minimize permanent walls and fixtures and preference mobile or easily reconfigurable shelving and furniture. Existing libraries being significantly renovated are to conform to the above program requirement, if possible.
2. All entrance doors intended for public use are to be automatically operated.
3. All libraries will be programmed with a Drive-up Book Drop adjacent to the Staff Workroom. The Book Drop is to be located in an area separated from the general flow of parking lot traffic.
4. Designer to design/specify exterior digital marquee signage.
5. All ground floor exterior glazing to have 3M™ Safety and Security Window Film Safety Series, or equal.
6. All libraries will be programmed to include a centrally located customer service desk able to accommodate two (2) staff members.
7. All libraries will be programmed to include a Public Meeting Room with a minimum seating capacity of 50. This space is to include:
    A. A retractable room divider.
    B. An single exterior entrance separate from the main library, for public access when the library is closed.
    C. Two separate entrances for when the room divider is in use.
8. All libraries will be programmed with two (2) Public Conference Rooms for small group meetings. Each room will be a minimum of 150 sq. ft. Verify each instance, per project with the Library Project Manager.
9. All libraries will be programmed to include the following staff spaces:
    A. Manager’s Office - minimum 100 sq. ft.
    B. Staff Conference Room - minimum 150 sq. ft.
    C. Staff Restroom

D. Staff Lactation Room - to include a sink and a lounge chair.

E. Staff Work Room - to include a desk space for each employee and a secured staff/delivery entrance equipped with a doorbell.

F. Staff Break Room - to include a refrigerator, microwave, large single-basin sink with a disposal, dining table with 4 chairs.

G. Staff Storage - minimum 100 sq. ft., door to have security lock.

10. Each meeting/conference space is to be equipped with an A/V presentation system. If the space is designed to be divided, each divided space will require A/V functionality.

11. In addition to Men's and Women's Public Restrooms, at least one (1) separate public Unisex Family Restroom with a baby changing table is to be provided.

12. Electrical and IT requirements:

    A. In public spaces, electrical outlet and network connection location strategically located to maximize public computer use and to accommodate a network-enabled printing/copying station. At least one location per floor.

    B. Free/publicly accessible Wi-Fi throughout the building and across the project site.

    C. IT Div. to provide Verkada cameras for CofM surveillance, no substitutions.

    D. RFID systems to be installed at all entrances.

NOTES

17

police department

NOTES

The Memphis Police Department is dedicated to maintaining public safety and solves problems by building trust, communication, and cooperation with the communities it serves. All City of Memphis Police Department projects shall include the following items:

1. Interview and Detainee Rooms shall include the following vandal resistant measures:
    A. Lighting controls shall be vandal resistant.
    B. Furniture shall be permanently secured to floors or walls.
    C. Use Acoustical Solution ‘Echo Eliminator Panels’ where acoustic materials are attached to walls or ceilings.
    D. Ceilings shall be fixed, suspended gypsum board with acoustic panels and wood backing.
    E. Walls shall be CMU with gypsum board and acoustic panels.
2. Public facing spaces (Desk Sergeants / Traffic Tickets / etc.) shall include the following:
    A. Glazing and walls shall be Level 3, bullet resistant, including metal framing and accessories / fixtures.
    B. Wall protection shall be Level 3 bullet resistant panels and UL-752 native equivalents such as ArmorTex, US Bullet Proofing, UHMWPE, or Fiberglass Well Armor.

18

parks

NOTES

Memphis Parks creates positive and safe places to provide community-centered experiences that connect all Memphians, celebrate life, and strengthen mind and body. All City of Memphis Parks projects shall include the following items:

ALL MEMPHIS PARKS FACILITIES

1. All new or renovated Parks facilities with a project cost greater than $500,000 are to be LEED Certified, at minimum.
2. All new Parks facilities are to be designed to have a meaningful relationship to the public street frontage and community at-large.
3. All new Parks facilities are to be designed with the intent of creating visual and physical connections between indoor spaces and park grounds.
4. All ground floor exterior glazing to have 3M™ Safety and Security Window Film Safety Series, or equal.
5. Hand towel, soap, and toilet paper dispensers. Parks is currently contracted (2024) with Staples to supply hand towels, soap, and toilet paper for its facilities. Ensure that dispensers are specified as follows to be compatible with the products supplied by Staples:
    A. Hand Soap Dispenser: GOJ5234-06 Staples Item #: 2728962.
    B. Surface-mount Paper Towel Dispenser: GEP59498A Staples Item #: 2579524.
    C. Recessed Paper Towel Dispenser: GEP59466A Staples Item #:2555236.
    D. Dual Compact Coreless Tissue Dispenser: GEP56784A Staples Item #: 2724432.
6. Parks is currently contracted (2024) with Johnson Controls to provide security and fire monitoring services in their facilities. The Consultant shall verify with Johnson Controls that they are able to install, service, and monitor the security and fire alarm systems equipment specified for the project.

COMMUNITY CENTER FACILITIES

7. Consultant to design a reception desk with direct visual command of all primary entrances. A camera monitoring system will be considered a secondary/backup means of monitoring. Cameras may be considered as an alternative to direct visual supervision and approved by the City of Memphis Project Manager on an instance by instance basis.

8. At the onset of planning/siting for new or renovated Community Centers with a project cost greater than $500,000, evaluate the proximity and characteristics of existing outdoor pools and gauge the feasibility to add (or replace an existing outdoor pool with) an indoor pool.

9. All new or renovated Community Centers with a project cost greater than $500,000 are to include an indoor walking track.

10. Gymnasium requirements:

    A. Specify a 220v receptacle in the gymnasium for the use of a commercial sander.

    B. Design/specify acoustical attenuation to control acoustical reverberations to meet the following criteria: RT60 = 1.5 seconds.

NOTES

19

public works

NOTES

Memphis Public Works is dedicated to maintaining and operating the City's infrastructure as well as code enforcement, environmental enforcement, and Memphis City Beautiful. All City of Memphis Public Works projects shall include the following items:

1. No specific regulations to date.

20

solid waste

NOTES

Memphis Solid Waste is responsible for the collection and disposal of all solid waste within the City with a commitment to reducing the amount of solid waste being disposed of in Memphis area landfills. All City of Memphis Solid Waste projects shall include the following items:

1. No specific regulations to date.

Resources

abbreviations/definitions

AHJ - Authority Having Jurisdiction

BD&C - Building Design and Construction department of the City of Memphis Engineering Division

Bidder - Construction companies who are preparing or have prepared bid proposals to the Owner for a contract to construct the subject Project

CIP - Capital Improvement Projects of the City of Memphis

City Project Team - All persons employed by the City of Memphis who are regularly involved each respective major step of the design and construction of the Project

CMAR – Construction Manager At Risk

CofM - The City of Memphis

Construction Management Team - A person or persons under contract to the City, to work as a representative of the City with the Project Manager, Consultant, and Contractor

Consultant – The designer (Architect / Engineer) contracted to the City of Memphis for design services

DIV. - City of Memphis Divisions

OAC - Owner / Architect (Consultant) / Contractor

Owner – The City of Memphis

Owner's Representative – City of Memphis, BD&C Project Manager.

Project – The completed work of physical improvements to City of Memphis property or properties that are the subject of the Consultant's respective Architectural and Engineering Services Agreement.

Project Manager - The City of Memphis Engineering Division, BD&C department designee. He or she is the focal point for all communications and decisions between the City, the Consultant, and Contractor. He or she is the only person through whom any adjustments to the Agreement or the Construction of the Project.

Project Team – All persons regularly involved each respective major step of the design and construction of the Project.

Quality Control - the Inspection, Testing, Certifications, and other associated requirements necessary to provide a finished project

Substitution - proposed changes in products, materials, equipment, and methods of construction from those required by the Contract Documents, proposed by Contractor

User - The particular City division who will operate the project on a daily basis.

capital budget

Use the Capital Budget to control the budget of a Project from Pre-Design through Post Occupancy. The image below is a representation of a blank Excel .XLSX document that Consultants shall obtain from the CofM Project Manager and keep updated throughout the life of the Project.

capital budget

project:
project address:
City IP No:
BD&C Project No:
Designer Project No:
Construction Contract No:
Construction Contract Date:

						PD date	SD date	DD date	CD date	BN date	PO date	
						totals	totals	totals	totals	totals	totals	notes
A	site acquisition costs	quantity	sqft		cost/unit	$ -	$ -	$ -	$ -	$ -	$ -	
	land acquisition	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
B	shell and core construction costs	quantity	sqft		cost/unit	$ -	$ -	$ -	$ -	$ -	$ -	
	shell and core	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	demolition costs	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	if applicable
	exterior amenities	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
C	interior buildout construction costs	quantity	sqft		cost/unit	$ -	$ -	$ -	$ -	$ -	$ -	
	interiors	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	demolition costs	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	if applicable
D	furniture/fixtures/equipment (ffe) costs	quantity	sf		cost/unit	$ -	$ -	$ -	$ -	$ -	$ -	
	furniture	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	fixtures	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	equipment	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	audio video equipment	1	1	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
E	professional services fees	percentage	budget		cost	$ -	$ -	$ -	$ -	$ -	$ -	
E.1	basic services (overall)	#DIV/0!	$ -	$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	architecture	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	structural engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	mechanical engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	plumbing engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	fire protection engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	electrical engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
E.2	specialty services (overall)	#DIV/0!	$ -	$	-	$ -	$ -	$ -	$ -	$ -	$ -	if requested by CofM
	civil engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	landscape architecture	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	acoustic and audio visual consulting	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	estimating	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	high-performance engineering	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	sustainability consulting	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	other consulting	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
F	other costs	quantity	cost/unit		cost	$ -	$ -	$ -	$ -	$ -	$ -	
F.1	reimbursable expenses			$	-	$ -	$ -	$ -	$ -	$ -	$ -	if requested / needed
	topo survey	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	geotech (soil borings)	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	3D scanning	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	environmental testing	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	asbestos testing	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	other items	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
F.2	CofM controlled items			$	-	$ -	$ -	$ -	$ -	$ -	$ -	
	low voltage wiring	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	security systems	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	access control	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	video security	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	other items	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	company name
	contingency	1	lump sum	$	-	$ -	$ -	$ -	$ -	$ -	$ -	set by CofM
					subtotal construction (A+B+C)	$ -	$ -	$ -	$ -	$ -	$ -	
					subtotal ffe (D)	$ -	$ -	$ -	$ -	$ -	$ -	
					subtotal soft costs (E+F)	$ -	$ -	$ -	$ -	$ -	$ -	
					total	$ -	$ -	$ -	$ -	$ -	$ -	

index of images

all images courtesy of archimania

1. **DESIGN FOR INTEGRATION**
   - **Crosstown Concourse** **Figure 1a**
     LRK
     1350 Concourse Ave. / Memphis, TN 38104
   - **Ed Rice Community Center** **Figure 1b**
     archimania
     2935 N. Watkins St. / Memphis, TN 38127

2. **DESIGN FOR EQUITABLE COMMUNITIES**
   - **Civil Rights Museum** **Figure 2a**
     Self+Tucker Architects
     450 Mulberry St. / Memphis, TN 38103
   - **community meeting** **Figure 2b**

3. **DESIGN FOR ECOSYSTEMS**
   - **Tom Lee Park** **Figure 3a**
     Studio Gang / SCAPE
     357 Riverside Dr. / Memphis, TN 38103
   - **Shelby Farms Park** **Figure 3b**
     Field Operations
     6903 Great View Dr. / Memphis, TN 38102

4. **DESIGN FOR WATER**
   - **OrthoSouth Bartlett** **Figure 4a**
     archimania
     3045 Kate Bond. Rd. / Bartlett, TN 38133
   - **stormwater diagram** **Figure 4b**

5. **DESIGN FOR ECONOMY**
   - **Fire Station No. 2** **Figure 5a**
     designshop architects
     7265 Raleigh Millington / Millington, TN 38053
   - **Ed Rice Community Center** **Figure 5b**
     archimania
     2935 N. Watkins St. / Memphis, TN 38127

6. **DESIGN FOR ENERGY**
   - **Methodist Hospital** **Figure 6a**
     brg3s architects
     1300 Wesley Dr. / Memphis, TN 38116
   - **energy model data** **Figure 6b**

7. **DESIGN FOR WELL-BEING**
   - **Crosstown Concourse** **Figure 7a**
     LRK
     1350 Concourse Ave. / Memphis, TN 38104
   - **Girls Inc. - South Park + LTD** **Figure 7b**
     archimania
     663 S. Cooper / Memphis, TN 38104

8. **DESIGN FOR RESOURCES**
   - **Universal Life Insurance** **Figure 8a**
     Self+Tucker Architects
     480 Dr. MLK , Jr. Ave. / Memphis, TN 38126
   - **Crosstown High School** **Figure 8b**
     ANF Architects
     1365 Tower Ave. / Memphis, TN 38104

9. **DESIGN FOR CHANGE**
   - **Orion Federal Credit Union** **Figure 9a**
     LRK
     400 Monroe Ave. / Memphis, TN 38103
   - **Vasco A. Smith, Jr. Admin.** **Figure 9b**
     archimania / Self+Tucker Architects
     160 N. Main St. / Memphis, TN 38103

10. **DESIGN FOR DISCOVERY**
    - **S. Cooper Office Building** **Figure 10a**
      archimania
      663/673 S. Cooper St. / Memphis, TN 38104
    - **energy monitor data** **Figure 10b**

contributors

archimania
The concept and content of the Design Directive has been developed and arranged by archimania architects in Memphis, TN.

The City of Memphis
The City of Memphis commissioned this Design Directive with the goal of bettering all City of Memphis projects, in recognition of the City's role in promoting wellness and environmental stewardship. The Divisions of Engineering, General Services, and the Department of Planning and Development funded the effort for the City; and the Building Design and Construction Department championed the Design Directive focus. Representatives from each Division of the City of Memphis have contributed to the process as a whole, and more specifically, to the Division Standards section of this Design Directive.

American Institute of Architects (AIA)
The content of the Universal Sections of this Design Directive have been based on the AIA's Framework for Design Excellence and has been tailored and applied more specifically to the regional context, culture, and climate of the City of Memphis in West Tennessee.

Each of the Design Principle sections begins with an introductory statement and leading questions that have been reproduced with the permission of the American Institute of Architects, 1735 New York Avenue, NW Washington, DC. Specific reproduced passages are denoted by an asterisk accompanying reproduced material, as demonstrated below.

[source: AIA's Framework for Design Excellence]

Haltom Engineering, LLC
Provided mechanical-related consulting services for all sections in this Design Directive.

Innovative Engineering Services, LLC (IES)
Provided electrical and plumbing-related consulting services for all sections in this Design Directive.

Self+Tucker Architects (STA)
Provided architecture-related consulting services for all sections in this Design Directive.

Local Peer Groups
Provided general input for all sections in this Design Directive.

index of revisions

2025 FEB 03

Design Directive for the Built Environment initial release.