

APPENDIX 6C**MODULE 6 – 90% CONSTRUCTION DOCUMENTS REVIEW COMMENTS****District:** *Town/City of X/Regional District***School:** *Name***Owner's Project Manager:** *Name***Designer Firm:** *Name***Submittal Received Date:** *Month Day, Year***Review Dates:** *Month Day, Year (Date sent to consultant for review – date of Design Director final review)***Reviewed by:** *First initial & last name (All reviewers)***MSBA REVIEW COMMENTS**

The following comments¹ on the 90% construction documents submittal are issued pursuant to a project submittal review document for the proposed project and presented as a 90% construction documents submission in accordance with the MSBA Module 6 Guidelines.

If the District has not yet executed a Project Funding Agreement (a "PFA"), be advised that the District is proceeding at its own risk. Without a PFA, the MSBA will not be able to reimburse the District for otherwise eligible costs that it may incur in this project phase or any later phases. Further, until the District obtains full ownership, control, and exclusive use of the Project site so that it has an unrestricted right to construct the Project as described in the Project, Scope and Budget Agreement, the MSBA will be unable to execute a PFA with the District. Regardless, the MSBA will provide the District with its review comments on the submittal. Neither the MSBA's receipt of the submittal nor the MSBA's transmittal of review comments to the District, however, shall be construed as an approval or endorsement of the District's decision to proceed into this phase without a PFA. The MSBA's comments solely reflect the MSBA's review of the documents submitted by the District and nothing more. The same shall apply to any additional documents submitted to the MSBA and to any comments provided by the MSBA without a PFA.

The MSBA will not provide submittal review comments for a project that has bid or is scheduled to issue bid documents for the majority of filed as well as non-filed sub-bid scope within two weeks of District receipt of MSBA review comments. In addition, the MSBA will not provide review comments for any portions of a project already bid as part of an "early bid package". Note that the MSBA requires the design team to include all early bid packages (if any) in each submittal, showing a complete project, to allow for MSBA coordination review for remaining portions of work that have not bid. If the scope of early bid packages is well advanced of the scheduled DD/CD review process, MSBA reserves the right to refrain from providing review comments, or to limit review comments to portions of the submittal that address conformance to the Project Scope and Budget Agreement.

The items listed below are to be included in each project submittal by the design team (OPM and Designer) to the extent that each item applies to the project, or the design team should provide an explanation why an item doesn't apply. The project submittal may be rejected by MSBA if all items below are not fully addressed by the project team. Unless specifically stated otherwise in the review comments below, the OPM and Designer deliverables are included in the submission with no further comment from MSBA required.

6C.1 Summary Comments

		Comments
•	Basic Project Information:	

¹ The written comments provided by the MSBA are solely for purposes of determining whether the submittal documents, analysis process, proposed planning concept and any other design documents submitted for MSBA review appear consistent with the MSBA's guidelines and requirements, and are not for the purpose of determining whether the proposed design and its process may meet any legal requirements imposed by federal, state or local law, including, but not limited to, zoning ordinances and by-laws, environmental regulations, building codes, sanitary codes, safety codes and public procurement laws or for the purpose of determining whether the proposed design and process meet any applicable professional standard of care or any other standard of care. Project Designers are obligated to implement detailed planning and technical review procedures to effect coordination of design criteria, buildability, and technical adequacy of project concepts. Each city, town and regional school district shall be solely responsible for ensuring that its project development concepts comply with all applicable provisions of federal, state, and local law. The MSBA recommends that each city, town and regional school district have its legal counsel review its development process and subsequent bid documents to ensure that it is in compliance with all provisions of federal, state and local law, prior to bidding. The MSBA shall not be responsible for any legal fees or costs of any kind that may be incurred by a city, town or regional school district in relation to MSBA requirements or the preparation and review of the project's planning process or plans and specifications.

<ul style="list-style-type: none"> ○ Provide an updated general introduction that presents a brief overview of the project details, describes the current status of the project, description and status of any early bid packages, any ongoing issues or new developments, any changes to the project since the previous submittal, how the district and design team are addressing these developments, and how these issues may affect the projects schedule, budget or conformance to the Project Scope and Budget Agreement. 	
<ul style="list-style-type: none"> ○ Enrollment - describe each of the following: <ul style="list-style-type: none"> ▪ grade configuration ▪ design enrollment ▪ number of PK students (note "N/A" if not applicable) 	
<ul style="list-style-type: none"> ○ GSF area- describe the following: <ul style="list-style-type: none"> ▪ GSF approved in the PFA ▪ GSF as currently proposed 	
<ul style="list-style-type: none"> ○ Project Type (all new, add/reno, reno) 	
<ul style="list-style-type: none"> ○ Delivery method (DBB, CMR). If CMR, describe contract status 	
<ul style="list-style-type: none"> ○ Provide any information regarding updates to the District's current project budget and anticipated construction cost, including any additional funding appropriations. 	

• Project Budget Compliance:

- The Project Funding Agreement ("PFA") has total project budget of \$XXX,XXX,XXX. The submittal notes that the current total project budget is \$XXX,XXX,XXX, and is *within budget / exceeds the PFA budget by \$X,XXX,XXX.*
- The PFA has an estimated construction cost of \$XXX,XXX,XXX. The submittal notes that the OPM's current reconciled estimated construction cost is \$XXX,XXX,XXX, and is *within budget / exceeds the PFA budget by \$X,XXX,XXX.*
- The (OPM/CMR)'s current construction cost estimate is \$XXX,XXX,XXX by (*firm name*). The Designer's current construction cost estimate is \$XXX,XXX,XXX by (*firm name*).

• General comments:

- XX

6C.2 OPM Deliverables:

6C.2.1 OPM Submittal Review & Coordination		Comments
•	OPM's separate signed cover letter verifying each of the following: 1) the OPM has reviewed and coordinated the materials, 2) the submittal is complete and conforms to MSBA requirements, 3) the proposed project as documented within each submittal is within the District's budget, and 4) the District has approved the materials for submission to the MSBA.	
•	Coordinate design; include written recommendations to the Owner. Address each of the following items individually, and describe how the OPM evaluated each item:	

	<ul style="list-style-type: none"> ○ Technical accuracy, coordination, & clarity ○ Efficiency & cost effectiveness ○ Operability ○ Constructability ○ Phasing ○ Bid ability ○ Site access during construction 	
•	Coordinate Commissioning consultant's review:	
	<ul style="list-style-type: none"> ○ Describe the commissioning consultant's review status. ○ Include a copy of the commissioning consultant's review & project team's response to each item. ○ Describe the consideration and incorporation of commissioning consultant's recommendations into the current submittal. 	
•	Coordinate the District response to the MSBA comments of previous submittals:	
	<ul style="list-style-type: none"> ○ Include a copy of the previous MSBA 60% Construction Development submittal review & District response, including any supplemental submittals and reviews. ○ Provide documentation of comments addressed and comments resolution outstanding. 	
•	OPM provide confirmation that the District has submitted a completed Designer Evaluation Form to the Division of Capital Asset Management and Maintenance (DCAMM), using the DCAMM/DSB Autocene platform, upon completion of the Schematic Design phase (refer to MSBA Project Advisory #79 for information regarding DCAMM/DSB Designer evaluations).	

6C.2.2 Project Schedule		Comments
•	The OPM is responsible for submitting a project schedule that conforms to the following requirements, whether the schedule is produced by the OPM or the CMR (if applicable). <i>A schedule that is limited to construction tasks is not acceptable and will be rejected.</i> All schedules should be presented in calendar days.	
•	Update project schedule: At a minimum, the schedule update should provide the same level of detail as was included in the Project Funding Agreement Exhibit C, expanded and updated to include milestones for Design Development, Bidding, Construction, and Closeout. The updated schedule should include proposed critical path and construction milestone information. In addition to the construction milestones, the schedule must also include the following information as listed in MSBA Module 7, Schedule Activities:	

○ Punch list start and end dates	
○ Project Registration date with the US Green Building Council ("USGBC")	
○ Provisional/Design package submittal date to USGBC	
○ MSBA 50% DCAMM Notification submittal date and MSBA 100% DCAMM Standard Contractor Evaluation Form notification date	
○ Designer Evaluation Form submissions to DCAMM: 1). upon completion of Schematic Design, 2). completion of 100% construction documents, and 3). final GC/CM payment.	
○ General Contractor/Construction Manager request for final payment	
○ Commissioning Consultant inspection (substantial completion plus approximately 10 months)	
○ Final Commissioning report to MSBA submittal date	
○ Final Construction package to USGBC including the Final Commissioning Report submittal date	
○ Anticipated final Green School Program Certification letter from USGBC issuance date	
○ Commissioning Certificate of Completion submittal date to MSBA	
○ Final reimbursement request submittal date to MSBA	
<ul style="list-style-type: none"> • Include application submission and approval dates in the project schedule for the following approvals, <i>coordinated with the Designer's submittal information</i>. In addition, provide dates for any other state or federal approval not listed below (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some items listed below might not be applicable to this project) Indicate "Non-Applicable" on the project schedule where appropriate: <ul style="list-style-type: none"> ○ DESE - Special Education approval by Department of Elementary and Secondary Education ○ MHC – Project Notification Form and approvals by MA Historical Commission ○ OIG - Construction Manager at Risk approval by the Office of Inspector General ○ Executive Office of Energy and Environmental Affairs/EEA: <ul style="list-style-type: none"> ▪ MEPA - MA Environmental Policy Act by Energy & Environmental Affairs: <ul style="list-style-type: none"> • ENF - Environmental Notification Form • EIR - Environmental Impact Report ▪ Article 97 Land Disposition Policy approval by Energy & Environmental Affairs ○ MA DEP - Massachusetts Department of Environmental Protection ○ MA DOT - Massachusetts Department of Transportation 	

<ul style="list-style-type: none"> ○ MA DPH - Massachusetts Department of Public Health (typically relating to CH74 Medical / Dental functions) 	
<ul style="list-style-type: none"> ○ EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency 	
<ul style="list-style-type: none"> ○ MAAB - Accessibility variances by MA Architectural Access Board 	
<ul style="list-style-type: none"> • Any state reviews or approvals which remain incomplete at the time of the 90% CD submission render the submission out of compliance with the PFA Section 4.12, and may result in suspension of reimbursement requests to the District until such time as all required state reviews or approvals are obtained. 	
<ul style="list-style-type: none"> • If there are outstanding reviews or approvals, provide revisions to the construction bid schedule. 	
<ul style="list-style-type: none"> • The schedule is to be updated and submitted to MSBA as often as is required to reflect any changes, including any changes to milestone dates, but must be submitted with each design submittal (DD, 60% CD, 90% CD). 	
<ul style="list-style-type: none"> • The schedule is to incorporate 21 calendar day required duration for each MSBA submission review, and a minimum 14 calendar days for project team incorporation of MSBA review comments as well as all others into the project documents prior to making the documents available to bidders. 35 calendar days between each MSBA design submission (DD, 60%, 90%) is the minimum acceptable duration; if the project team believes additional time is required for any or all the submissions the durations for these activities are to be increased accordingly. 	

6C.2.3 Project Scope and Budget		Comments
<ul style="list-style-type: none"> • Develop project scope and budget, cost estimates and reconciliation: <ul style="list-style-type: none"> ○ OPM construction cost estimate using CSI MasterFormat 6-digit format to Level 3 and MGL c.149 s 44F (filed sub-bid) format showing unit rates and quantities; with escalation projected to the mid-point of construction. ○ OPM reconciliation of the OPM/CMR and Designer construction cost estimates including a description of the method to derive this reconciliation. Refer to this link for an example of the Cost Estimate Reconciliation Form. 		
<ul style="list-style-type: none"> ○ Updated Cost Estimate Comparison Form. Refer to this link for an example of the Cost Estimate Comparison Form. 		
<ul style="list-style-type: none"> • CMR (if applicable): <ul style="list-style-type: none"> ○ If Owner has not yet contracted with a Construction Manager (CM), the OPM must develop a construction 		

	cost estimate as described above for comparison with the Designer's cost estimate.	
	<ul style="list-style-type: none"> ○ If the Owner has given the CM a Notice to Proceed, the OPM must review cost estimates provided by the Designer and CM and provide a Designer's and CM's construction cost estimates reconciliation as described above. 	
•	Updated project budget in the MSBA total project budget format, based on the reconciled construction cost estimate. If the reconciled estimate is not used for the updated project budget, provide an explanation.	
•	Describe any early bid packages anticipated scope and schedule. Include any early bid packages (if applicable). <i>The submittal must include all early bid packages, showing a complete project, to allow for MSBA coordination review.</i> Provide bid tables for a completed sub-bid package.	
•	Value Engineering recommendations (if any):	
	<ul style="list-style-type: none"> ○ Provide the list of potential and accepted Value Engineering recommendations, and associated costs of each item. 	
	<ul style="list-style-type: none"> ○ Value Engineering Summary Tracking Sheet completed and updated for this submittal indicating compliance with the PFA budget, and considerations or implementation of Value Engineering (if any). Refer to this link for the Value Engineering Summary Tracking Sheet. <i>Note that all project submittals must include a completed and current Value Engineering Summary Tracking Sheet in Excel format regardless of the status of the project's budget.</i> 	
	<ul style="list-style-type: none"> ○ For any Value Engineering recommendations which have been accepted, provide a copy of the Committee vote. 	
•	Provide a letter confirming that prequalification requirements for the General Contractor (if applicable) and subcontractors have been completed, and a summary table of the pre-qualified general contractor (if applicable) and subcontractors.	

6C.3 Designer Deliverables:

6C.3.1 General Requirements		Comments
•	Submit an updated work plan.	
•	Updated and expanded Basis of Design narrative description for each following discipline:	
	<ul style="list-style-type: none"> ○ Architecture 	
	<ul style="list-style-type: none"> ○ Structural: narrative must include lateral bracing methods and how earthquake code requirements will be met 	
	<ul style="list-style-type: none"> ○ Civil 	

	<ul style="list-style-type: none"> ○ MEP + FP 	
	<ul style="list-style-type: none"> ○ Data/Comms./Security 	
●	Updated building code analysis	
●	Provide an updated description of all local "Green Communities" designations for this project (if any) and describe compliance measures to conform to related building or site requirements including the Stretch Code, Municipal Opt-in Specialized "Net Zero Energy" Code, and any other locally required ordinances related to sustainability, based on local approvals required at the scheduled project permit date.	
●	Provide an updated LEED scorecard indicating current attempted credits, and a statement from the designer describing any changes in the project scope and/or LEED scorecard as compared to the sustainability goals identified in the Project Scope and Budget Agreement.	
●	Site vulnerability risk assessment / evaluation – provide a statement from the designer describing any changes to the project scope included in the Project Scope and Budget submittal based on the risk assessment of the selected site as described in the Module 3 Feasibility Study Guidelines.	
●	Provide a final list identifying all proposed proprietary items (if any) with an affidavit which shall indicate that an elected body of the district (school committee, city or town council, or selectmen, but not ad-hoc building committee) has been presented with proposals for proprietary requirements approval action, has had an opportunity to investigate, or to require staff or consultant investigation upon each item so proposed, and has majority voted in an open public session that it is in the public interest to do so. Provide MSBA with a certified copy of the elected body vote.	
●	Describe proposed exterior and interior materials and finishes. Confirm that material, finish and color selections have been reviewed by the District for approval.	
●	Updated structural calculations	
●	Independent structural design review (an MSBA requirement for all projects with new construction over 10,000 sf). MSBA requires a structural engineering peer review submission as part of the Final (100%) Construction Documents submission, to include documentation of any issues identified by the Peer Reviewer. Actions are to be advanced well prior to the 90% CD submission to engage the peer reviewer, and that scheduling be arranged to allow final structural design drawings and calculations to be submitted to the peer reviewer at the completion of the 90% Construction Documents submittal, <i>or earlier as may be required for early (structural) bid packages</i> , in order to incorporate comments and response action reporting in the final construction documents and avoid delays. Confirm this process has been initiated.	

•	Updated energy model calculations	
•	Updated Life Cycle cost analysis for energy and water consuming devices	
•	Updated heat gain and loss calculations for Heating, Ventilating and Air Conditioning systems	
•	Updated calculations showing total electrical load	
•	Updated security and visual access requirements:	
	<ul style="list-style-type: none"> ○ Confirmation that the persons responsible for the District's emergency procedures implementation, and responding emergency medical, fire protection, and police agency representatives have been consulted in the planning process and any associated requirements have been included in the project. 	
	<ul style="list-style-type: none"> ○ Identify other security related items particular to the District and/or the proposed project. 	
	<ul style="list-style-type: none"> ○ Verification that the following safety and security related issues have been reviewed and are in accordance with the District's procedures as noted above: <ul style="list-style-type: none"> ▪ Main entrance design – describe District protocol for visitor entry and check-in related to the current design for visitors to remain in the vestibule versus a side sub-vestibule. 	
	<ul style="list-style-type: none"> ▪ Classroom lockset hardware - confirm hardware functions are compatible with the District's protocols related to lockdown. 	
	<ul style="list-style-type: none"> ▪ Classroom / Instructional spaces visibility - confirm that the inclusion of sidelights at entrance locations is compatible with the District's current standards related to visibility from corridors and whether any related vision control option measures are to be incorporated. 	
	<ul style="list-style-type: none"> ▪ Alternative entry/exit locations - confirm project includes site and building signage, as may be required by District's emergency procedures, to identify locations where first responders may more directly reach a person needing medical attention; Knox Boxes; Fire Alarm Control Panels, and provisions for building plans to be delivered to local fire and response agencies. 	
•	Facility and Maintenance requirements:	
	<ul style="list-style-type: none"> ○ Confirmation that the district personnel responsible for maintenance have been consulted in the planning process and any associated requirements have been considered for this project. Describe maintenance related items particular to the District and/or the proposed project 	
	<ul style="list-style-type: none"> ○ Confirmation that the district personnel responsible for maintenance have been consulted regarding any changes in the proposed design resulting from Value Engineering (if any). 	

○ Confirmation that the district personnel responsible for budgeting and maintenance have participated in discussions regarding the selection and long-term operational and maintenance costs of the mechanical systems and building maintenance system controls.	
○ Confirmation that the district personnel responsible for the maintenance have participated in discussions regarding the proposed training program and that these discussions have determined that the hours and the schedule for training included in the contract are sufficient to train the facility operational and maintenance personnel to operate the building management system, as designed. Confirmation that adequate hours have been scheduled both before the opening of the school and after the turnover of the building.	
○ Verification that at a minimum the following issues have been reviewed:	
▪ Training hours and scheduling	
▪ HVAC systems	
▪ Building Management Systems	
▪ Lighting fixtures and controls	
▪ Cleaning procedures and materials	
▪ Access to all roof surfaces	
▪ Mechanical room access	
• Quality Control narratives, supporting plans and documents demonstrating each of the following (<i>a general / summary comment is not acceptable, the narrative must address each of the following</i>):	
○ Ceiling clearances	
○ Mechanical room and shaft sizes	
○ Coordinate specifications and drawings	
○ Filed sub-bid work	
○ Scheduling	
○ Equipment and power	
○ Existing and new construction	
○ Phasing	

6C.3.2 Space Summary		Comments
	MSBA REVIEWER WILL INSERT SPACE SUMMARY TABLE HERE	
•	Updated space summary and signed certification that reflects the current design	
•	Provide confirmation that the spaces conform to the MSBA minimum and maximum size range requirements described in the space summary including: <ul style="list-style-type: none"> ○ Classrooms & number of sinks ○ Science Labs 	

	<ul style="list-style-type: none"> ○ STE rooms (if applicable) ○ SPED spaces ○ Gymnasium ○ Auditorium (if applicable) 	
•	Provide confirmation that the grossing factor in the submitted space summary does not exceed 1.50	
•	Comparison of the current design with the final educational program, and confirmation that there are no variations. If there are variations, the written summary must address the following:	
	<ul style="list-style-type: none"> ○ Explain deviations within the space summary from the Project Funding Agreement. The MSBA will either: <ul style="list-style-type: none"> ▪ MSBA accepts this variation to the approved project with no further action required. ▪ Prior to MSBA accepting this variation to the project, the Designer must describe in detail the reason for the change. 	
	<ul style="list-style-type: none"> ○ The MSBA considers that deviations include size changes of a specific space, the total program area nsf (e.g. general classrooms, voc tech, dining etc.), space location, surrounding space adjacencies and/or the intended room purpose: <ul style="list-style-type: none"> ▪ The submittal must clearly call out deviations to location and surrounding adjacencies using redlines or “clouding”. ▪ The explanation should clearly identify the basis of the change identifying both architectural and/or programmatic reasons. ▪ If the basis of the change is programmatic, the submittal should include a red-lined version of the educational plan included in the Project Funding Agreement. 	
•	Regarding DESE approved SPED spaces:	
	<ul style="list-style-type: none"> ○ Include a copy of the most recent letter from DESE approving the current proposed SPED spaces. 	
	<ul style="list-style-type: none"> ○ Confirm that the DESE approved SPED spaces have not deviated, using the definition above; or: <ul style="list-style-type: none"> ▪ If the District wishes to submit a change to its DESE approved submittal, it must 1) confirm that all changes to SPED spaces are final; 2) provide a new SPED submittal to the MSBA in the original submittal format (described in Module 4 Schematic Design Section 4.1.1 and Mod 4 Appendix 4B) noting any changes with clouded floor plans and red-lined narratives and tables; and 3) indicate how the project schedule can accommodate a potential DESE resubmittal and approval. Please provide a separate package for changes to DESE approved SPED spaces. ▪ If the District chooses not to change from the DESE approved submittal it should explain 	

	when and how the spaces will be returned to the approved size, configuration and location.	
•	Regarding DESE Approved Public Day Education spaces (Indicate "Not Applicable" if the project does not include DESE approved Public Day Education spaces):	
	<ul style="list-style-type: none"> ○ If applicable, confirm that the DESE approved Public Day Education spaces have not deviated, using the definition above; or: <ul style="list-style-type: none"> ▪ If the District wishes to submit a change to its DESE approved submittal, it must 1) confirm that all changes to Public Day Education spaces are final; 2) provide a new submittal in the original submittal format, noting any changes with clouded floor plans and red-lined narratives and tables; and 3) indicate how the project schedule can accommodate a potential DESE resubmittal and approval. Please provide a separate package for changes to Public Day Education spaces. ▪ If the District chooses not to change from the DESE approved submittal it should confirm that the spaces are the same or explain when and how the spaces will be returned to the approved size, configuration and location. 	
•	Regarding DESE approved Chapter 74 Program spaces (Indicate "Not Applicable" if the project does not include DESE approved Chapter 74 spaces):	
	○ If applicable, confirm that the proposed Chapter 74 spaces conform to the current DESE Chapter 74 manual for Vocational Technical Education Programs.	
	○ Include a copy of the most recent letter from DESE approving the current proposed Chapter 74 Program spaces.	
	○ Confirm that a Chapter 74 Meeting took place with the MSBA and DESE, describe any modifications to the proposed design and any remaining follow-up coordination items.	
	<ul style="list-style-type: none"> ○ If applicable, confirm that the DESE approved Chapter 74 Program spaces have not deviated, using the definition above, or: <ul style="list-style-type: none"> ▪ If the District wishes to submit a change to its DESE approved submittal, it must 1) confirm that all changes to Chapter 74 Program spaces are final; 2) provide a new submittal utilizing the original submittal format, noting any changes with clouded floor plans and red-lined narratives and tables; and 3) indicate how the project schedule can accommodate a potential DESE resubmittal and approval. Please provide a separate package for changes to the Chapter 74 Programming. ▪ If the District chooses not to change from the DESE approved submittal it should explain 	

	when and how the spaces will be returned to the approved size, configuration and location.	
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6C.3.3 Project Approvals	Comments
<ul style="list-style-type: none"> Describe the status of the following approvals. In addition, provide the status of any other state or federal approval not listed below (the following list is not a comprehensive itemization of required state approvals; other requirements may apply, and some items listed below may not be applicable to this project). Provide a copy of the appropriate application forms and/or approval letters where applicable. Indicate "Not Applicable" where appropriate and describe why each item is not applicable. For each agency approval required for this project, indicate the date when approval was received. All required approvals should have an associated approval date indicated as part of the 90% CD submission and prior to advertising for bids. Confirm that the required approvals are coordinated with the OPM's project schedule: 	
<ul style="list-style-type: none"> o DESE - Special Education approval by Department of Elementary and Secondary Education 	
<ul style="list-style-type: none"> o MHC – Project Notification Form and approvals by MA Historical Commission 	
<ul style="list-style-type: none"> o OIG - Construction Manager at Risk approval by the Office of Inspector General 	
<ul style="list-style-type: none"> o Executive Office of Energy and Environmental Affairs / EEA: 	
<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ MSBA- State Site Permit Tracking Worksheet (refer to MSBA Project Advisory #88 for additional information). <i>Note that all project submittals must include a completed and current State Site Permit Tracking Worksheet regardless of the status of the project's site approvals.</i> 	
<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ MEPA - MA Environmental Policy Act by Energy & Environmental Affairs: 	
<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> • ENF - Environmental Notification Form 	
<ul style="list-style-type: none"> <ul style="list-style-type: none"> <ul style="list-style-type: none"> • EIR - Environmental Impact Report 	
<ul style="list-style-type: none"> o MA DEP - Massachusetts Department of Environmental Protection 	
<ul style="list-style-type: none"> o MA DOT - Massachusetts Department of Transportation 	
<ul style="list-style-type: none"> o MA DPH - Massachusetts Department of Public Health (typically relating to CH74 Medical / Dental functions) 	
<ul style="list-style-type: none"> o EPA –NPDES National Pollutant Discharge Elimination System Notice of Intent approval by the US Environmental Protection Agency (or indicate as "by GC/CMR") 	

	<ul style="list-style-type: none"> MAAB - Accessibility variances by MA Architectural Access Board 	
	<ul style="list-style-type: none"> Confirmation that the Project has undergone review and obtained all necessary approvals by any departments or Commonwealth agencies required by law to review the Project, including but not limited to the approvals listed above. Attach such documentation letters evidencing such reviews and approvals. 	
	<ul style="list-style-type: none"> In accordance with Project Funding Agreement (the "PFA") Section 4.12, the District must obtain such reviews or approvals prior to the construction bids solicitation. Any state reviews or approvals which remain incomplete at the 90% CD submission render the submission out of compliance with the PFA Section 4.12, and may result in suspension of reimbursement requests to the District until such time as all required state reviews or approvals are obtained. 	
	<ul style="list-style-type: none"> List and target dates for all local zoning approvals, testing and permits. 	
	<ul style="list-style-type: none"> Provide a certification that all applicable utility officials have been contacted by the Designer regarding each basic utility connection. 	

6C.3.4 Cost Estimate		Comments
	<ul style="list-style-type: none"> Provide a final Designer's construction cost estimate, based on the 90% Construction Documents, including cost estimates for general conditions, overhead and profit, insurance, bonds, and all other items; allowances expressed as percentage rates for construction contingencies, and other mutually agreed upon contingencies. Prepare the construction cost estimate using CSI MasterFormat 6-digit format to Level 3 and MGL c.149 s 44F (filed sub-bid) format showing unit rates and quantities; with escalation projected to the mid-point of construction. 	
	<ul style="list-style-type: none"> The estimate date should be no earlier than the 90% Construction Documents date. 	
	<ul style="list-style-type: none"> Provide summary sheets including the following: <ul style="list-style-type: none"> Date that the estimate was prepared (value date) Anticipated bid date Project and contract number Project title and location Designer name Estimator name Site cost (including all utilities) Building cost (including fixed equipment) Estimated construction cost of each work phase, totaled 	

	<ul style="list-style-type: none"> ○ Items 1 and 2 work costs, as distinguished in the General Contractor's bid forms, individually totaled 	
6C.3.5 Drawings (developed to 90% CD progress level)		Comments
•	Half-size drawings only. Confirm that text, symbols, shading and all drawings content are legible.	
•	If applicable, include early bid package contract documents. <i>The submittal must include all early bid packages, showing a complete project, to allow for MSBA coordination review.</i>	
•	Cover sheet showing a drawings list (the project title should be visible when the drawings are rolled)	
•	Sheet(s) containing all symbols, abbreviations and notes applicable to each discipline	
•	Site and Utility drawings should show the following:	
	○ Proposed work layout and location with details	
	○ Existing and proposed contours	
	○ Building locations fixed and referenced from main survey baseline	
	○ Floor elevations at each entrance/exit and key exterior grades at perimeter showing drainage away from the building	
	○ Site Benchmarks	
	○ Boring locations	
	○ Retaining walls	
	○ Landscaping and planting	
	○ All utility service lines, systems and structures for electricity, gas (if applicable), oil, water, steam, telephone, CATV, fire alarm, sanitary and storm drainage	
	○ Contract limit line and storage area for construction materials	
	○ Site survey which includes, but is not limited to, all existing foundations, obstructions and other site characteristics	
	○ Coordinate light pole bases, flag poles, signage, concrete pads & landscape enclosure walls with other disciplines	
	○ Verify accessibility compliance at paved areas and building approaches	
	○ Exterior benches, flag poles, signage	
•	Mobilization and enabling works	
•	Architectural drawings showing the following:	
	○ Demolition drawings	
	○ Floor plans of each floor, with dimensions, column locations, floor elevations, door designations, partition types & fire-rated partitions and smoke	

partitions, built in furniture and equipment, keyed to other architectural drawings and coordinated with exterior grade elevations at all interior to exterior transitions	
○ Key plans / overall plans where required	
○ Phasing, temporary trailers, storage & fences, gates & parking	
○ Large scale plans showing key areas e.g. lobby, special spaces. Indicate floor surface materials (minimum 1/4" = 1'-0" before reduction)	
○ Knox box & fire alarm control panel locations (plans & elevations)	
○ Roof plans showing the following:	
▪ Proposed systems type	
▪ Pitch and drainage pattern	
▪ Roof drains, gutters and scuppers	
▪ Skylights, penthouses, major equipment, chimneys	
▪ Roof access and ladders	
▪ Walk pads	
▪ Rooftop Solar Readiness area, PV support and interconnection pathways	
○ Project sign (verify content); Per MSBA Regulations section 2.04, Sub-section 1, Paragraph G, Approved project shall have a project identification sign on the construction site during the construction period. Said sign shall be at least four feet by eight feet in size, shall be visible from the primary roadway adjoining the site, and shall include the following: "This project funded in part by the Massachusetts School Building Authority." .	
○ Building sections updated and coordinated with plans, elevations and rooftop equipment. Indicate floor to ceiling heights and floor-to-floor heights. Label all spaces.	
○ Building elevations showing the following:	
▪ Full height elevations including roof structures, ladders, mechanical equipment, chimneys, penthouses, mechanical louvers, signage, lighting, security devices, gutters & downspouts, hose bibbs, and all other systems.	
▪ Floor elevations, floor-to-floor height, and overall height related to benchmarks on site plans	
▪ Windows, storefront, and curtain wall systems	
▪ All columns located on a centerline and coordinated with the structural drawings	
▪ Materials indicating major control and expansion joints, and divisions of materials where required	

	<ul style="list-style-type: none"> ▪ Exterior grades and topographical features in context 	
	<ul style="list-style-type: none"> ○ Wall sections indicating dimensions, flashing, anchorage, reinforcing, masonry coursing, cladding, and all other conditions at wall, roof, foundation, interior floors; coordinated with exterior grade elevations 	
	<ul style="list-style-type: none"> ○ Details demonstrating continuous thermal insulation and thermal breaks between all conditioned interior spaces and unconditioned exterior spaces (including parking garages, loading zones and other open areas) 	
	<ul style="list-style-type: none"> ○ Exterior details, for roofing, flashing and other details showing all conditions 	
	<ul style="list-style-type: none"> ○ Interior and exterior expansion joints, control joints, construction joints, and waterstops, detailed and coordinated with structural drawings 	
	<ul style="list-style-type: none"> ○ Doors, windows, entrances, and storefront; schedules and details 	
	<ul style="list-style-type: none"> ○ Vertical circulation plans, sections and details including ramps, stairs, lifts and elevators 	
	<ul style="list-style-type: none"> ○ Elevator venting, hoist beam, thresholds, ladder, sump, wall penetrations, waterproofing 	
	<ul style="list-style-type: none"> ○ Guardrails and handrails including details 	
	<ul style="list-style-type: none"> ○ Interior elevations of all significant and typical spaces 	
	<ul style="list-style-type: none"> ○ Interior details including casework, paneling surfacing and acoustical treatment 	
	<ul style="list-style-type: none"> ○ Flooring & wall material patterns & associated transition details 	
	<ul style="list-style-type: none"> ○ Interior glazing elevations and details 	
	<ul style="list-style-type: none"> ○ Reflected ceiling plans coordinated with fire protection, mechanical and electrical drawings 	
	<ul style="list-style-type: none"> ○ Ceiling details 	
	<ul style="list-style-type: none"> ○ Access panels indicated on the drawings and coordinated with the MEP/FP locations, sizes and any other requirements 	
	<ul style="list-style-type: none"> ○ Schedules (clearly define new or existing): 	
	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ Finishes 	
	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ Doors 	
	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ Windows 	
•	Structural drawings showing the following:	
	<ul style="list-style-type: none"> ○ Structural drawings legend and/or graphical symbols 	
	<ul style="list-style-type: none"> ○ Foundation plans with bottom grades showing all footing layouts, walls, slabs on grade including reinforcing, grade beams, and columns; include design soil bearing pressures and live loads for each area 	
	<ul style="list-style-type: none"> ○ Structural floor and roof plans including framing, finished floor elevations and depressed slab areas, with locations and dimensions for all openings and 	

	depressions, coordinated with the architectural drawings	
	o Complete foundation wall elevation and typical sections, with reinforcing indicating location, dimensions and grades for all footings, steps and wall openings	
	o Complete details and section with dimensions for all construction including expansion and construction joints, reinforcing and other embedded items. Coordinate construction and expansion joint details with specified materials including caulking and sealant.	
	o All lintels, beams, joists, and columns are identified (with typical sizes shown) on schedules or on drawings	
	o All structural supports required for mechanical equipment	
	o General notes including the following information: class and 28 day concrete strength for each portion, structural steel and concrete reinforcing design stresses for each structural member type, concrete cover for each structural member type, shrinkage and temperature steel requirements, reinforcing laps for main reinforcing and temperature steel; bend point, cutoff, and hook locations for all members, minimum beam and lintel bearing.	
	o Floor and roof structural design load documentation (live and dead)	
•	Fire protection drawings showing the following:	
	o Fire protection drawings legend and/or graphical symbols	
	o Standpipe systems, sprinkler systems, suppression systems, fire pumps, accessories, and piping	
	o All piping, equipment, fixtures, valves and devices shall be located and sized	
	o Design criteria shall be provided on the drawings in accordance with NFPA requirements	
	o All required access panel locations and sizes coordinated with the architectural drawings	
•	Plumbing drawings showing the following:	
	o Plumbing drawings legend and/or graphical symbols	
	o All work done by the plumbing subcontractor, which includes all water, gas (if applicable), sanitary and storm wastes, and accessories	
	o Plumbing fixtures trapping and venting including floor drains. Provide location dimensions for floor drains in coordination with the structural plans.	
	o Confirm any hazard or noxious contaminants such as chimneys, plumbing vents or cooling towers are located a minimum 25 feet from outside air intakes or such openings are a minimum two feet below the contaminant source and ten feet horizontally from	

	the nearest edge of the air intake to the nearest edge of the contaminant source (refer to 780 CMR Massachusetts State Building Code in effect at the time of project approval). Consider adding filters to the contaminant source if necessary.	
	○ Water and gas (if applicable) supply sources, storm and sanitary discharge mains	
	○ All piping sizes shall be indicated on drawings and riser diagrams, including flow and pitch directions	
	○ All accessories, valves, fixtures including all drinking fountains and grease traps for kitchen waste	
	○ Verify eyewash stations with tepid water are provided in all areas where chemicals are stored or used	
	○ All piping and connections required for other trades (e.g., kitchen equipment, HVAC make-up water, etc.)	
	○ Acid waste (where required), vents and neutralization systems for laboratories	
	○ Plumbing riser diagrams	
	○ Domestic water booster pumps, boiler feed water, meter location, hose bibs	
	○ Domestic hot water: storage tanks, piping material	
	○ Hanger details, expansion joint details	
	○ All required access panel locations and sizes coordinated with the architectural drawings	
	○ Backflow preventers and cleanouts	
•	Heating, ventilating and air conditioning drawings showing the following:	
	○ Mechanical drawings legend and/or graphical symbols	
	○ Large scale plans of all mechanical & electrical spaces showing equipment to scale	
	○ All piping and ductwork systems shall be located and sized. All ductwork shall be shown double line and drawn to scale.	
	○ All piping and duct systems sized at all reductions and riser diagrams	
	○ All flow directions and pitch on piping, and duct systems indicate flow and volumes direction	
	○ All equipment shall have enough servicing and/or replacement space indicated on drawings.	
	○ All equipment, accessories, valves and dampers	
	○ All required access panel locations and sizes coordinated with the architectural drawings	
	○ Cooling system pumps, chillers, cooling towers, air handling units, ductwork system and dampers, fan details, temperature control system, air and hydronic balancing equipment, and schedules shall be indicated.	
	○ Confirm outside air intake openings are a minimum 25 feet from any hazard or noxious contaminants such as chimneys, plumbing vents, cooling towers,	

	streets, alleys, parking lots and loading docks. When locating an air intake within 25 feet of a contaminant source is unavoidable, such opening shall be a minimum two feet below the contaminant source and ten feet horizontally from the nearest edge of the air intake to the nearest edge of the contaminant source. All intakes shall be six feet above landscaped grade including soil, lawn, shrubs, or any plant life within 1.5 feet horizontally of intake.	
	<ul style="list-style-type: none"> ○ Cooling tower (where required) shall be indicated on the drawings showing site location, elevations and equipment layout floor plan and typical flow diagram as related to the total HVAC system. 	
	<ul style="list-style-type: none"> ○ All fire and smoke dampers 	
	<ul style="list-style-type: none"> ○ Mechanical room designs: <ul style="list-style-type: none"> ▪ Vent pipes for safety valves, relief valves, back pressure valves and tanks shall be extended above flat roofs in accordance with all governing authorities ▪ In all designs for boiler and refrigeration plants, include a complete floor plan indicating all major mechanical equipment location and service space. ▪ In new and/or replacement boiler and refrigeration plants designs, provide a flow diagram detailing steam or hot water distribution systems, return systems, including all existing equipment and their function, as well as any proposed expansions with all necessary instrumentation and controls. 	
	<ul style="list-style-type: none"> • Electrical Drawings showing the following: <ul style="list-style-type: none"> ○ Electrical drawings legend and/or graphical symbols ○ General arrangement: Outline each floor layout, floor and ceiling heights and elevations, and type construction, including concrete pads. ○ Indicate interface with other systems. Identify any work by general contractor or other trades ○ Interior lighting system: Light fixture schedules, circuiting location and fixture mounting heights, receptacle and switch outlets, lamp sizes and types, conduits, all other accessories and riser diagrams shall be indicated on drawings. Indicate electrical fixtures and conduits supporting method details. Designer shall specify that all electrical lighting fixtures be supported from the building structure, and shall be independent of ducts, pipes, ceilings and their supporting members. Comply with seismic design criteria. ○ Power system: Locations, types and control method for all motors, heaters, appliances, controllers, starters, branch circuits, feeder conductors and conduits. Indicate riser diagrams. Show electrical conduit supporting method and details. For larger 	

	projects, thermostats and control wiring are normally covered under the HVAC sub-contract, assure coordination.	
	○ Fire Alarm, FACP, Data, Communications, CATV/CCTV Systems: device types and locations, outlets and equipment, service connections, wiring diagrams, all other essential details.	
	○ Services: location and details, whether overhead or underground, feeder sizes, switchgear and transformers plans and elevations, metering and service switchboard arrangements, wiring and ground fault diagram and bus ducts.	
	○ General stations and sub-stations: Location, size, connection method and generator protection, transformers, exciters, motor generators, switch gear, and associated equipment, current characteristics and equipment capacities. Indicate equipment connections with one line and/or wiring diagrams and schedule all major equipment and instruments items.	
	○ Designated/future solar electrical service on the electrical panel and interconnected utility service pathways to designated/future rooftop solar readiness areas	
	○ Underground work: manholes sizes and locations, cable types, duct number, sizes and locations, cable support sizes, types and locations, fireproofing, duct line profile, and one-line connection diagrams	
	○ Pole line work: Location, length, treatment and class of poles, guying, cross arms, insulators, circuiting, transformers, protective and switching devices, lightning arresters, special structures, diagrams, current characteristics and grounding	
	○ Exterior lighting: Location, size, and transformer types, luminary, poles, light standards, cables, ducts, and manholes, control equipment details and connection diagrams	
	○ Emergency system (where provided) details including transfer switch, fuel type	
	○ One-line diagram indicating load KVA, and available short circuit amperes at each transformer, switchboard, distribution panel board, branch circuit panel board, and at major equipment	
	○ Riser diagrams for all systems	

6C.3.6 Project Manual (developed to 90% CD progress level)		Comments
•	If applicable, include early bid package contract documents. <i>The submittal must include all early bid packages, showing a complete project, to allow for MSBA coordination review.</i>	

<ul style="list-style-type: none"> • The technical specifications format in CSI Master format (full-length, 3-part, 48 division current version) with separate sections for each class of work required by M.G.L. c. 149 §44F. 	
<ul style="list-style-type: none"> • Confirmation that the contract meets the applicable requirements of M.G.L. c. 149, § 44A (2)(g) and contains workforce participation goals for minorities and women. Confirm that the contract includes the processes and procedures to ensure compliance with the workforce participation goals, including reporting and enforcement provisions. 	
<ul style="list-style-type: none"> • Confirmation that the District consulted with the MA Supplier Diversity Office ("SDO") and local counsel to ensure that the contract meets the applicable requirements of M.G.L. c. 7C, §6, M.G.L. c. 7, §61, and associated SDO guidelines and regulations; contains the applicable SDO-calculated, project-specific goals for Minority Business Enterprise ("MBE"), Women Business Enterprise ("WBE"), and Veteran Business Enterprise ("VBE")/Service-Disabled Veteran-Owned Business Enterprise ("SDVOBE") participation; and includes the processes and procedures to ensure compliance with the MBE, WBE, and VBE/SDVOBE goals, including reporting and enforcement provisions. 	
<ul style="list-style-type: none"> • For each material or equipment item, the specifications shall provide for a minimum three named material or equipment brands and the words "or equal" or a material or equipment description which can be met by a minimum three manufacturers or producers, and the words "or equal". Proprietary products shall not be specified except as provided by M.G.L. c. 30, § 39M; however, when they are specified, proprietary specifications are subject to the "or equal" provisions of c. 30, § 39M. 	
<ul style="list-style-type: none"> • Do not specify that a product or system shall require prequalification for use prior to bidding. 	
<ul style="list-style-type: none"> • Include a copy of the geotechnical report, including test boring hole locations and dates, and soil investigation results, including water levels, allowable solid bearing pressure recommendations, foundations and bottom grades of footing and slabs. 	
<ul style="list-style-type: none"> • Indicate all required filed sub-bids specification sections. 	
<ul style="list-style-type: none"> • Each filed sub-bid section shall detail all labor and materials required by the sub-trade and list, by number, those drawings (and only those drawings) indicating that sub-trade work. In addition, list drawings indicating trade work that appears on drawings that are not customarily included in the trade work, when applicable. 	
<ul style="list-style-type: none"> • Staging, scaffolding, coring, drilling, cutting, patching, refuse collection and disposal, demolition work and cleaning task, allocation policy and proposed language shall be carefully assigned to avoid duplication or 	

	omission, and coordinated with all filed sub-bid sections.	
•	Describe the work extent, the materials and workmanship, and include the work under the proper section. If any portion of work included in a specifications section is to be performed by a trade covered by another section, there shall be clear and distinct cross-referencing between the sections. Merely to state "by others" is not acceptable.	
•	Specify work in appropriate Sections according to local trade jurisdiction.	
•	In sections for which filed sub-bids are required, refrain from using such terms as "the Contractor," the "Heating Contractor," or "the Plumbing Contractor," but where necessary for clarity refer to the "HVAC Subcontractor," the "General Contractor" and so on.	
•	Alternates, if approved in writing by the owner, shall be properly described and cross-referenced in the project manual and drawings. An alternate proposal sheet shall be prepared by the Designer for insertion into the contract form.	
•	Allowances are prohibited pursuant to M.G.L. c. 149, § 44G(A).	
•	Unit price items, if permitted or ordered by the owner, shall be properly described in the specifications.	
•	Indicate goals for compliance with USGBC LEED standards.	
•	Do not use general clauses intended to be all-inclusive in lieu of complete descriptions.	
•	Do not duplicate standard requirements that are contained in the contract form.	
•	Use consistency throughout. The word "will" shall be used to designate what the owner, authority, owner's project manager, or the Designer can be expected to do, and the word "shall" shall be used to designate what is mandatory for the contractor or subcontractors to do.	
•	Use the same term throughout for the same subject and the term shall be the same as that used on the drawings.	
•	Do not use the term "etc.".	
•	Avoid such terms as "to the satisfaction of the Designer", "as directed by the Designer", "as approved" and "as required".	
•	Do not give numbers both in words and figures. Numbers less than 10 shall be written in words, 10 and higher numbers shall be written in figures. In expressing dimensions, figures such as 2 in., 16 in., 7 ft., 6 in., shall be used.	
•	Specify materials mined or manufactured in Massachusetts first and the United States of America second whenever possible.	

6C.3.7 Project Coordination		Comments
•	Verify the submittal is coordinated with any early-bid packages, if applicable.	
•	Room names and numbers are coordinated between all disciplines.	
•	Verify all details are accurately cross-referenced to the correct plan sheet.	
•	Finish grade elevations coordinated between all disciplines.	
•	Materials/soil terms used in the Earthwork specification is coordinated with architectural, structural and civil specifications and plans.	
•	Coordinate paving & landscape patching with civil utility & plumbing work.	
•	Coordinate paving details, specifications & landscape design to mitigate frost heaving at paved areas.	
•	Structural dimensions match architectural drawings.	
•	Column grid lines and column orientation match Architectural drawings.	
•	Building elevations and sections include column lines	
•	Column locations and bearing walls coordinated with all other disciplines.	
•	Structural grids are included on all floor plans	
•	Verify coursing dimensions at vertical masonry construction.	
•	Seismic detailing coordinated with architectural drawings.	
•	Confirm that there are no beams and columns protruding horizontally and vertically into stairwells, and other interior spaces.	
•	Slab depressions are indicated in the structural drawings and coordinated with the architectural finishes and plumbing drawings.	
•	Room wall/floor/ceiling construction coordinated with the finish schedules.	
•	Verify that the structural, mechanical, or other disciplines, do not conflict with architectural plans or specifications.	
•	Coordinate downspout leader locations with architectural, civil & plumbing drawings	
•	Coordinate thermal insulation and thermal breaks between conditioned interior spaces and unconditioned exterior spaces.	
•	Verify that architectural wall/partition type smoke and fire rating requirements are coordinated with the building code analysis floor plan information, and MEP/FP drawings indicate appropriate smoke/fire dampers and louvers where required.	
•	Coordinate access to mechanical and plumbing systems and architectural finishes. Confirm that requirements	

	for access panel sizes and locations are coordinated between architectural and MEP/FP drawings and specifications. Indicate access panel sizes and locations in the drawings.	
•	Locations of emergency equipment (fire alarm control panel, Knox box, fire extinguishers, etc.) are indicated in plans and elevations, and coordinated between disciplines. Recessed equipment is coordinated with finishes.	
•	Coordinate various accessibility dimensional requirements for PK to grade six toilet room layouts, fixtures & accessories (where applicable).	
•	Coordinate outside air intake opening locations and any hazard or noxious contaminants as described by 780 CMR: Massachusetts State Building Code.	
•	Mechanical equipment power requirements and physical locations, including special information as to who mounts, connects, tests, etc.	
•	Verify potential spatial conflicts in mechanical equipment.	
•	Coordinate roof plans with MEP drawings; indicate roof top systems, adequate access to all roof surfaces, walk pads to all equipment that requires maintenance, & guardrails.	
•	Coordinate access to electrical power and data where needed for maintenance of rooftop equipment.	
•	Coordinate Solar Readiness areas on roof plans, structural plans and electrical/plumbing drawings.	
•	Equipment plan coordinates with architectural plans.	
•	All kitchen equipment connected to utility systems.	
•	The Designer confirms that the project continues to comply with the MSBA High School Science Lab Guidelines and/or Recommendations of Best Practices for K-12 STEM Learning Spaces .	