Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

City Construction Agency Waste Management Specifications					
	DDC—01 74 19	NYC DDC Highway Specifications for DOT projects (08-01-15) NYC DDC Standard Sewer and Watermain Specifications for DEP projects (07-01-14)	DDC—7.14	DEP—01 74 20	Parks
Applicability	Public Buildings except 1.5.C only applies where selected for a particular contract See also 01 81 13.03 (LEED v3) and 01 81 13.04 (LEED v4) See Exhibit 3 for 2003 DDC CDW Manual Principles	Infrastructure	Infrastructure (Sustainable Construction for Envision credit)	Infrastructure (everything except work under NYC DDC Standard Sewer and Watermain work for DEP projects)	Parkland projects
Design Phase	Question: Does design team focus on waste prevention strategies in design as outlined in 2003 DDC CDW Manual (Exhibit 3)?		Design team determines by final design to apply this this specification to project bid package	Determination that project requires measurable quantities and tracking documentation, including but not limited to those that may be submitted for LEED, Envision or other 3rd party sustainability rating system Design Sustainability Program determines the percentage goal for end-of-Project rates of salvage/recycling of construction waste as detailed in Construction Waste Estimate Report (CWER) generated by design engineer and that was included in the bid exhibit documents; CWER is expressly excluded from construction contract and is available for information purposes only Other design phase information to come from DEP	Prior to the start of construction, Parks Maintenance and Operations division is notified and they can come on site to salvage above ground items, such as benches and play equipment parts if they wish. However, salvage is not tracked. During the design stage, many of the designers do consider re-use, but this sometimes is not possible due to requirements on capital funding, which requires the item to last at least 5 years.
Construction Phase	Definition of C+D Waste refers to Solid Waste, which does not align with NYC DEC's Beneficial Use Designations (BUD); if a BUD then no longer deemed Solid Waste under NYC DEC law Off-site sorting: materials combined on-site and sent to processing facility for sorting; measured weights only • Two methods: #1 diversion rate from weight of individual diverted material type divided by weight of commingled waste; #2 diversion rate from waste sorting facility average diversion rate multiplied by commingled material weight On-site sorting: measured weights only for material types sorted in segregated containers or project areas as segregated diverted material type; diversion rate from weight of individual diverted material type	DOT Work Contractor to dispose all waste materials in a legal and proper manner • If contractor uses DSNY facility, provide affidavit to Commissioner indicating compliance with DSNY rules and regulations, site used, and proof of purchase or dump tickets • If contractor uses a site other than a DSNY facility, provide affidavit to Commissioner indicating compliance with all laws for removal of waste material, site used and a paid receipt; NYS-based facilities must be NYS DEC registered Solid Waste Management Facilities Does permits use of "gently used" plywood for protecting trees DEP Work	Purpose: to provide sustainable construction requirements, including required documentation, to permit DDC to finalize awarded Envision certification beyond the baseline Minimum Required Implementation requirements in the contract that have been evaluated and assessed to ensure planned Envision certification is met; this specification is intended to encourage sustainable construction planning as well as compensate contractor for activities beyond the baseline Minimum Required Implementation requirements in the contract; if contractor chooses to exceed baseline Minimum Required Implementation requirements, contractor may be eligible for an incentive payment per 7.14.4 Methods • Sustainable Planning ○ Collaboration: contractor must attend all meetings required to discuss and comprehend Envision framework, including but not limited to Envision construction kick-off meeting and regular sustainability check-ins for execution of	Diversion: to remove, or have removed, from site for recycling, reuse or salvage, material that might otherwise be sent to landfill; diversion does NOT include using the material as alternative daily cover at landfill or burning, incinerating or thermal destruction Contractor to meet all applicable federal, state and local regulatory requirements as well as DEP EHS policies and procedures for on-site management, transportation and recycling or disposal of all construction waste materials generated during construction Construction Waste Management Plan (CWMP) • Contractor to develop and implement a CWMP for the project under which waste and recyclable shall be collected, sorted and deposited to be submitted for review and approval by engineer 30 days after receipt of Notice to Proceed and before any removal of construction waste from project site • CWMP shall be based on the construction waste recycling percentage goal established via the Design Sustainability Program as the percentage	<u>Unclassified Excavation</u> Contractor responsible for all excavating required for grading, trenching, paving, curbs, construction and reconstruction of structures, such as buildings, subsurface structures or any other structures and disposing of all excavated materials per plans, specs and engineer directions • Disposal of excess excavated fill materials including soil or similar materials designated as contaminated non-hazardous shall be paid for separately under its own respective bid item Contract can use excavation materials suitable in engineer's opinion in making embankments and filling low areas of work and at such places engineer directs Contractor shall store all excavated materials suitable in engineer's opinion for backfilling within the limits of the contract work where directed by engineer; after inspection and approval of masonry foundations and other work to be covered by backfill, contractor shall fill the

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	Recycling does not include burning, incinerating or thermally destruction; but sending to Waste-to-Energy facilities that comply with European Standard (EN) (not US EPA standards) is possible Reuse is only permitted on Project Site generating C+D Waste (DNSY 1994 interpretive memo; not aligned with NYS DEC BUD regs) Alternative ACD: material other than earthen material placed on surface of active face of municipal solid Waste landfill at end of each work day to control vectors, fires, odors, blowing litter and scavenging Waste: extra material(s) that has reached the end of its useful life in its intended use; includes Salvageble, Returnable, Recyclable and Reusable material Waste Management Plan (WMP): a project-related plan for the collection, transportation and disposal of Waste generated at the construction site with the purpose of ultimately reducing amount of material going to landfills NYC establishes (via LL 32/2016 (amending LL 86/2005) and Charter sec. 224.1) the subject project (LEED v3 or LEED v4) must generate the least amount of Waste possible and use processes that ensure generation of as little Waste possible under LEED standards to obtain a LEED certification for the project Diversion: • Generally, a minimum of 5 material types, both structural and non-structural, are to be identified in project WMP for diversion • with exception of LEED v4 projects with demolition ADC Waste, minimum of 75 % of total project C+D Waste (by weight) must be diverted from landfill for at least 4 listed material types (see Exhibit 2) • LEED v4 projects with demolition ADC Waste, minimum of 50 % of total project C+D Waste (by weight) must be diverted from landfill for at least 3 listed material types (see Exhibit 2) and ACD material does not qualify as material diverted from disposal Recycling on the job, subject to Commissioner approval, is encouraged on project site, such as crushing and	Contractor to remove (or abandon) all sewers, water mains, drains, culverts, basins, basin connectors, structures and all portions of any watercourse in, through or across any street or easement rendered unnecessary by the construction work as indicated on project plans or as specified or directed • Cost of removal and abandonment of items above, including breaking down and filling in inlets, basins, manholes, valve chambers and other appurtenant structures are at contractor's expense and deemed included in bid prices for all items of work • With the exception of Metropolitan Valves (6"-20"), which the Contractor shall salvage and deliver to DEP (with no additional payment), contractor shall not return any salvageable material to DEP regardless of condition, which material shall become contractor's property for removal and disposal from the site • Contractor shall not dispose of any excavated or other material, except as otherwise specified (see below) within the limits of existing or projected public street or road, or excavate and remove such material without Commissioner's written permission; contractor shall not store construction material or equipment on public property without all required permits and engineer permission • All approved excavated suitable fill material within the project limits shall be utilized for backfill per subsection 40-06-2(c); approved earth, free of bricks, blocks, excavated pavement materials and debris, stumps, roots, and other organic matter, as well as ashes, oil and other perishable or foreign matter, with particles no larger than ¼ inch in diameter; all excavated material meeting above parameters with fine content equal to or less than 20 % and equal to or less than 30 % (portion of material passing a No. 200 sieve) shall be reused • If approved in writing by engineer, excavated material determined to be unsuitable may be processes (screened, blended and/or crushed) to produce select granular fill material or clean fill material (subsections 26.01.2(b), 26.01.2(D); no separate or additional	each provision and a Sustainable Construction Work Plan (SCWP) ○ Initial documentation: within 30 days of Notice of Award, Contractor must submit SCWP to engineer for approval; contractor must assign a point of contact for tracking and submitting all necessary materials and documentation including but not limited to meeting minutes, reports, plans, data compilations, delivery tickets, calculations, manuals, policies estimates; Minimum Required Implementation is approved standard sustainable construction pending documents tracker and no incentive for this scope ○ Planning and subsequent documentation: within 60 days of Notice of Award, contractor must submit SCWP Sustainable Construction Implementation Worksheet to engineer for approval; contractor must conduct at least 1 Sustainable Construction Planning Review before construction begins to review, analyze and select strategies listed in provisions; calculations may be necessary to ensure awarded Envision verification level is upheld; Minimum Required Implementation is approved Sustainable Construction Implementation Worksheet • 9 other major scopes of sustainable construction listed below exceed the baseline Minimum Required Implementation requirements that are already in the initial SCWP ○ *Construction Energy Conservation* includes 7 strategies and <u>Minimum Required Implementation</u> includes 2-3 of the 7 strategies ○ *Construction Water Consumption* includes 8 strategies and <u>Minimum Required Implementation</u> includes 3-4 of the 8 strategies ○ *Constructing with Recycled Materials* requires contractor to source materials from manufacturers and suppliers that implement sustainable practices and maximize the qualifying materials that are to be permanent materials incorporated into the work, excluding plants, soil, rock, land clearing debris; <u>Minimum Required Implementation</u> requires 5-14% of materials of recycled origin ○ *Sustainable Procurement of Construction Materials* requires contractor to outline process and criteria for selecting and calculating materials, supplies and equipment to maximize the amount of materials procured in sustainable manner	goal for end-of-Project rates of salvage/recycling of construction waste as detailed in Construction Waste Estimate Report (CWER) generated by design engineer and that was included in the bid exhibit documents(CWER is expressly excluded from construction contract and is available to contractor for information purposes only) • CWMP to contain: ○ Construction and Demolition Diversion: estimate of total proposed construction and demolition (C+D) waste to be generated and the percentage of C+D waste to be diverted from landfill by types and quantities during prosecution of the work; identify at least 5 C+D materials (both structural and non-structural) targeted for diversion; approximate a percentage of overall project waste that these materials represent; this diversion shall be developed based on the estimates included in the CWER; formula for diversion from landfill percentage = (total estimated waste diverted from landfill/total estimated waste produced by project) x 100; estimates calculated by weight (tons); list of C+D waste shall be specific to project site and may include but not limited to materials on list in Exhibit 5 ○ Soil Diversion: estimate of total proposed excavated soil to be generated and the percentage of this soil to be diverted from landfill via onsite and/or offsite reuse (including types and quantities); soil diversion may be achieved through onsite or offsite reuse and wherever possible reuse of excess excavated soils on site should be prioritized over offsite reuse (refer to 02 24-20 – Soil Sampling and Analysis for sampling and regulatory requirements; formula for soil diversion = (total estimated soil diverted from landfill / total estimated soil produced by project) x 100 ○ Materials handling procedures: description of means by which any waste materials will be protected from contamination via segregation and description of means employed in recycling materials consistent with requirements by recycling processors to be utilized and DSNY. ○ List of waste transporters, transfer stations, beneficial use facilities, disposal facilities and recyclers that contractor intends to use during project with info	excavated voids around masonry and other work with clean excavated material with no direct payment for re-handling excavated materials for such backfilling as considered included in bid price Material disposal plan (MDP) for excess excavated material in excess of 10 CYs • Submitted to engineer for approval 21 day before trucking operations commence and includes at minimum ○ List of all anticipated materials proposed for disposal/recycling and respective anticipated quantities ○ Proposed list of disposal/recycling facilities and copies of relevant permits ○ Proposed list of transporters and copies of relevant permits ○ A copy of the waste tracking document to be uses to record all disposal activities (NYS DEC Part 360 Waste Tracking Document included as sample example) • Contractor to submit completed copies of waste tracking documents recording all disposal activities after all disposal activity is completed • MDP intended to document that all material will be disposed per applicable NYC, NYS and federal regulations • Contractor must dispose of excess excavated material in compliance with NYC DEC regulations, including NYS DEC requirements for soil or similar materials or material classified by NYS DEC as "fill", such as testing results and approval letter from disposal facility receiving the material • Bid price for quantity of unclassified excavation is by CY of material measured in original position, excavated and disposed of per engineer directions; rock excavation, removal of steel bar reinforced concrete, average concrete, and curbs (including those with steel reinforcement) to be paid under respective contract terms <u>Disposal of Contaminated, Non-hazardous Materials and Waste</u> • For handling, transporting and disposing material deemed unsuitable for reuse (beyond base cost under Unclassified Excavation above), defined to be soil and fill materials (in excess of what a project requires) having chemical constituents in excess of the Restricted Residential Soil Cleanup Objectives in Title 6 NYCRR Part 375 Soil Cleanup Objectives (SCOs) and that

	reuse of removed sound concrete and stone
	Land-clearing debris is not considered construction, demolition or renovation Waste and is not to be included as contribution to Waste Diversion; NYS DEC BUDs include land clearing waste (excavated soil), so this does not align with NYC DEC's BUDs .
	Contractor is responsible for development and implementation of a project WMP; contractor's subcontractors must assist in WMP development and collect and deposit their Waste and Recyclable materials in accordance with approved WMP
	• Draft WMP Within the earlier of 15 days of Notice to Proceed or any Waste removal, contractor must submit to Commissioner a draft WMP, which demonstrates how contractor will meet performance goals and contain:
	  • List of material types targeted for Reuse, Salvage or Recycling and estimated amounts for each material type in tons and percentage of overall construction waste of each material stream; contact information of receiving facilities/companies that will purchase/accept each material
	• Estimates of percentage of overall C+D waste to be sent to landfills
	• Description of On-site methods and/or Off-site sorting methods (Method 1 or Method 2) for all materials to be removed from site
	  ○ If mixed C+D waste to be sorted Off-site, provide letter from processor stating the average percentage of mixed C+D waste (exclusive of ADC for LEED v4 projects) they recycle
	• Landfill information including names of landfills where non-recyclable/reusable/salvageable waste will be disposed and tipping fee lists
		payment made for all costs necessary/required to perform processing work	measured by project's total cost, weight or volume; listed strategies include ISO 14001, 14025, 14044; 3rd party verified sustainability labels; 3rd party verified corporate sustainability manufacturers/suppliers per GRI; flexibility is permitted to develop additional practices that are equivalent to or exceed above but contractor must justify them and submit alternative practices to engineer for approval; Minimum Required Implementation requires 5-14% of materials procured with sustainable practices
			○ *Construction Waste Management* requires contractor to submit, to engineer for approval, Construction Waste Management Planning Worksheet as part of SCWP within 60 days of Notice to Proceed to maximize the waste diverted from landfills in order to minimize negative impacts to the environment due to waste production from construction activities; Minimum Required Implementation requires Construction Waste Management Planning Worksheet and 25-49% of wasted diverted from landfill; the Construction Waste Management Planning Worksheet must:
			  ▪ Estimate total generated demolition and construction waste to be diverted from disposal
			  ▪ Maintain detailed records of all recycled materials, including legible copies of on-site logs, weight tickets and receipts
			  ▪ Employ strategies including but not limited to: identifying licensed haulers; transfer stations, processors of recyclables and transportation procedures; designating specific neat, clean and clearly marked area to facilitate separation and non-contamination of materials for potential salvage, recycling and waste; providing on-site instruction covering separation, handling and recycling, salvage, reuse, and return methods to be employed by all parties at appropriate project stages; sending waste material towards recycling or reclamation facilities; sending waste to manufacturers for use as post-consumer
				including permits; CWMP should list where both recyclable and non-recyclable materials will be recycled, reused or disposed and how those materials will be transported
				  ○ The proposer method of removal of non-hazardous waste and requirement that transporter must hold current NYS Part 364 permit to transport waste to TSDF that accepts non-hazardous waste (does this operate as requirement to transport within NYS boundaries?)
				  ○ Coordination of product deliveries to designated prepared areas to minimize site storage time and potential damage to stored materials and return of packing materials where economically feasible
				• CWMP implementation:
				  ○ Contractor responsible for implementation of approved CWMP including provision of containers and removal of all waste, non-returned surplus materials and debris from site per CWMP, in compliance with all federal, state and local regulations, including DEP EHS Policies and Procedures
				  ○ Monies received for recycling and/or salvaged materials remain with Contractor except for items specifically identified in contract documents
				  ○ Contractor to use construction and demolition methods and processes to ensure generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination and other factors
				  ○ When encountered in work, contractor to dispose of construction waste by recycling methods per LL 19/1989, LL 87/192, and NYC's Commercial Recycling Regulations-Rules Governing the Recycling of Private Carter Collected Waste (09/93); contractor to separate all recyclable material from normal refuse per DSNY rules; dispose of material not required to be recycled as specified per all applicable federal, state and local regulations and DEP EHS Policies and Procedures
				  ○ When encountered as part of work for sites outside NYC, contractor to dispose of construction waste per all applicable federal, state and local regulations and DEP EHS Policies and Procedures
				• Monthly submittals: contractor to track monthly waste and soil generation/diversion/disposal data
					require approved recycling or disposal at a regulated facility
					• Activities include handling, loading including temporary stockpile, characterization including testing, management including characterization for treatment and/or disposal, compliance with regulations, specifications etc.
					• Documentation more involved than above an includes resident engineer signature of all waste manifests and bills of lading for waste transportation for either re-use, treatment, recycling, or disposal to an agency-approved facility
					• Work to be performed by OSHA certified workers, experienced in dealing with this type of material; storage and handling areas shall have impoundment systems or placed on impervious surfaces not directly on the ground and covered with impervious compatible materials to prevent exposure to wind and precipitation; plus more
					• Generally: (1) whenever and wherever possible direct-load all excavated contaminated material and waste onto vehicles for off-site transportation for re-use, treatment, recycling and/or disposal and (2) whenever and wherever possible re-use excavated materials as on-site backfill in areas that are suitable for fill
					• Temporary stockpile criteria (not detailed here)
					• Excess material and waste disposal plan within 21 days after Order-to-Work and before mobilization for contaminated non-hazardous materials and waste
					  ○ For each proposed disposal facility, submit similar information to above MDP but also federal and state disposal facility identification number and permit expiration date and copies of currently value permits with much more information related to those permits and a listing of number and types of analytical testing required for materials for each proposed disposal facility
					  ○ Provide a sampling plan
					  ○ For each proposed transporter, submit copies of currently valid permits that indicate permit presently in effect, for Part 364 permits the proposed disposal facility identified on permit, and for other states traversed non-NYS state issued vehicle and hauling permits

	• Material handling procedures: specify whether materials will be separated or commingled with planned diversion strategies; expected amount of each material type; where materials will be taken and how recycling facility will process the material; description of means by which any recyclable/reusable/salvageable material will be protected from contamination and collected in a manner to meet designated recycling processor acceptance requirements; description of means of transportation and destination of recycled materials
	• Contractor to describe spread sheet and documentation for regular meetings to be held monthly (or as directed by Commissioner) on WMP issues and how it will submit monthly meeting reports
	• <u>Final WMP</u> Contractor to submit <u>final WMP</u> within 15 days of Commissioner's approval of draft WMP
	• Implementation of Final WMP
	  • Before demolition and construction start, Contractor must implement WMP, coordinate WMP with all affected trades and designate one person as the Construction Waste Management Representative
	  ○ Construction Waste Management Representative will be responsible for communicating the progress of the WMP with the Commissioner (see below) on a regular basis and for assembling the required LEED documentation (see below)
	• Contractor is responsible for oversight and documentation of WMP results and providing containers and removing all waste, non-returnable surplus materials and rubbish from site per WMP removal
			recycled content; sending waste to composting facility; composting on site; reuse or recycle materials on site; if appropriate, reusing waste material as infill; exploring opportunities to sell or donate salvaged materials that have been protected from contamination; stockpiling and reusing non-contaminated non-hazardous excavated materials with beneficial reuse of soil to be given priority; creating purchase agreements requesting vendor deliveries that reduce the amount of packaging, use packaging made of recyclable materials and/or vendor to take back discarded packaging for own reuse/recycling
			○ *Enhanced Construction Health and Safety* includes 8 strategies and <u>Minimum Required Implementation</u> includes 3-5 of the 8 strategies
			○ *Stakeholder Relations during Construction* includes addressing noise, safety and wayfinding for the public, access and mobility for the public and minimizing intrusive lighting in order to minimize or eliminate temporary inconveniences associated with construction and <u>Minimum Required Implementation</u> includes of 3 of the 4 listed mitigation impacts
			○ *Balanced Earthworks during Construction* requires contractor to use any of the 5 listed strategies to reduce environmental impacts of moving soils and other excavated materials; contractor must endeavor to reuse all soil, eliminating borrow fill, or source all necessary fill and excavated materials as close as possible to project site using the 5 strategies; <u>Minimum Required Implementation</u> includes 30% reuse of excavated soils OR source the borrow fill from within 25 miles of project site; <u>strategies</u> include identifying opportunities to minimize grading and retain soil on site to reduce total site soil handling; eliminating need for transporting additional soil; beneficially reusing excavated material from project site on nearby sites or from nearby sites as fill for project site; looking for options close to project site to send or source these materials; recording
				per 01 35 27 – Environmental Health and Safety Requirements, para. 1.07.C. Monthly Contractor EHS Report
				• Final submittal: contractor to submit a Construction Waste Management Final Summary Report upon Substantial Completion that tabulates total waste material, quantities diverted from landfill and means by which it is diverted
				• Project meetings: CWMP and implementation shall be discussed at pre-construction meeting and regular monthly progress meetings
				• Delivery, storage and handling: contractor shall
				  ○ designate separate receiving/storage areas for delivered materials and equipment to minimize waste due to excessive materials mishandling, misapplication, weather and other damage
				  ○ promptly inspect shipments to assure products comply with requirements, quantities are correct and products are undamaged; promptly return damaged shipments or incorrect orders to manufacturer
				  ○ use special care in removal, storage and reinstallation of materials/equipment to be reused/salvaged to insure proper function in completed work
				  ○ periodically inspect stored products to assure they are undamaged and are maintained under required conditions
				  ○ train employees in handling and storing waste materials per DEP EHS Policies and Procedures
					• Testing results and disposal facility approval at least 14 calendar days before beginning of soil disposal
					• Bills of lading, truck manifests and scale tickets
					• Waste disposal log
					• Price for disposal of contaminated non-hazardous materials and waste shall be the number of tons of material per truck manifest and scale tickets disposed per engineer plans, specs and directions; unit price/ton disposed and shall include cost of all labor, material, equipment and incidental expenses necessary per above; payment will not include demurrage for vehicles or loads rejected by the facility for any reason
					<u>Earth Moving Operations</u> works in conjunction with <u>Unclassified Excavation</u> above
					<u>Strip, Store and Spread Existing Topsoil</u>
					Involves removal of existing vegetation by flush cutting to max. height of 2" and rototilling or rotovating the area and removing roots and top growth of woody plants from stockpile before spreading; stripping topsoil to depth of 5" from all field areas and removing stones greater than 2" diameter and other leaves, roots, and other objectionable materials and move/store separately in compliance with tree protection plan (i.e., not under trees) and covered with heavy-duty black tarps to kill weeds and prevent regrowth (failure to comply will result in contractor having to purchase at own expense topsoil in equivalent amount at own expense); prior to spreading contractor to remove any remaining clumps of undecomposed sod, roots or other herbaceous material larger than 2" diameter
					<u>Remove Carpet and Infill</u>
					• Contractor to send elements of synthetic turf (including 95% of infill material both on top and below carpet and vacuumed rubber infill prior to carpet removal) to recycler for new products (list of known recyclers provided) and cannot send them to landfill; must certify that material has been recycled into new products; contractor to provide documented reuse of infill; documents include bill of landing with documentation of adaptive reuse
					• Construction waste management plan (CWMP): contractor to submit CWMP prior to work start of application for engineer approval and at minimum should identify material diversion goals, all materials to be removed, how materials will be sorted on-site, identify recycling locations,

	○ Monies received for Salvaged materials remain with Contractor, except for monies for items specifically identified as belonging to others in specifications or as indicated in Contract Drawings • Contractor must distribute copies of WMP to each subcontractor, resident engineer, construction manager and Commissioner ○ Subcontractors are responsible for collecting their waste, non-returnable surplus materials and rubbish per WMP • Contractor must provide on-site instruction of proper waste management procedures to be used by all parties at appropriate project stages • Contractor to conduct waste management operations to ensure minimum interference with site vegetation, roads, streets, walkways and other adjacent, occupied and used facilities—operations include but not limited to: • Collect commingled waste and/or separate all recycled waste per WMP with specific designated project site areas and clearly marked containers and bins as acceptable and unacceptable materials • Inspect containers and bins for contamination and remove contaminated materials if found • Comply with specific general condition provisions for controlling dust and dirt, environmental protection and noise control • Except for items or material to be salvaged, recycled or otherwise removed, remove waste material from project site and legally dispose of them in a manner acceptable to authorities with jurisdiction, including: not allowing waste materials to be disposed accumulate on site and removing and transporting debris in a manner to prevent		source/destination of any materials transported on- or off-site and proximity to project site (hazardous excavated materials excluded from total calculations) ○ *Enhanced Surface and Groundwater Quality during Construction* includes 7 strategies and <u>Minimum Required Implementation</u> includes Surface and Groundwater Quality Planning Worksheet and 2 of 7 strategies. Incentive percent values in lump sum breakdown for 7.14 to support contractor going beyond Minimum Required Implementation levels		implementation protocols and parties responsible for implementing CWMP; contractor responsible for reviewing all recycling requirements with all subcontractors, continuously tracking removed materials to ensure CWMP implementation; contractor to submit means and methods of operations along with equipment to satisfaction of engineer; contractor to obtain, retain and submit all verification records including hauling receipt, waste management reports, certification that materials were diverted from incineration and recycled into new products at required percentage, including the list of products, and bill of lading from recycler along with adaptive reuse in new products documentation; contractor to remove materials so that existing recycled plastic lumber edge, shock pad and existing concrete are not damaged for use in new installation, if designated to remain (with repair and replacement due to failure as part of bid price) and take extreme care to prevent disturbance of base aggregate compaction and planarity (with repair of areas deemed disturbed by engineer the responsibility of the contractor)

	spillage on adjacent surfaces and areas; not burning waste materials; transporting waste materials off project site and legally disposing them
	• Additional demolition and salvage requirements: demolition and salvage of additional items indicated in other sections of the project specifications require special attention as part of the overall 75 % diversion from landfills—see other sections of project specifications
	• Monthly WMP progress reports submitted by Contractor with the following information:
	  • Project title, name of company completing report, and period covered by report
	  • Report on disposal of all project site waste using the DDC C+D Waste Management log form for each shipment of material removed from site including: date and ticket number of removal; material hauler identity; material type; waste sorting method; total waste quantity (T//CY—either acceptable by must be consistent for all shipments and all materials for project duration or will be returned for revision and resubmission) by type; quantity of waste salvaged, recycled and/or reused by type; total quantity of waste diverted from landfill (recycled, salvaged or reused) as percentage of total waste; recipient of each material type
	  • Monthly and cumulative project totals of waste, quantity diverted and percentage diverted
	  • Legible copies of on-site logs, weight tickets and receipts; receipts must be from charitable organizations, recycling and/or disposal site operators that can legally accept the materials for reuse, recycling or disposal purposes; to be kept for 7 years after project completion
	• Contractor to submit signed final LEED construction waste report				

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	tabulating total waste material, quantities diverted and diversion means and state that requirements for applicable LEED credit have been met including: at least 4 material streams for diversion, documentation of recycling rates for commingled facilities, and documentation for a waste-to-energy strategy compliance with EN standards and justification for the strategy • Refrigerant recovery (detail not included)				
Important Features	• Excavated soil excluded as permitted by NYS DEC BUDs • Only on-site reuse permitted (i.e., transfer to another city capital project for direct reuse not allowed for diversion purposes); possibly due to 1995 DSNY interpretive memo of its transfer station rules, attached to DEP Infrastructure specification, aimed at prohibiting stockpiling on city streets for off-site uses	• With limited DEP exceptions, no mention of reuse • No mention of diversion from landfills • NYS DEC EDL, 02-12-21 and 1995 DSNY interpretive memo attached to DEP specs, may be supporting an informal circular CDW economy based on these specs with no explicit waste management planning requirements (suggesting value in these materials)	• Aligns with NYS DEC BUDs	• Relation of CWMP to design team estimates in CWER • Diversion percentage formula = (total estimated waste diverted from landfill/total estimated waste produced by project) x 100 • Items for diversion include land clearing debris; soil diversion may be achieved through onsite or offsite reuse and wherever possible reuse of excess excavated soils on site should be prioritized over offsite reuse (refer to 02 24-20 – Soil Sampling and Analysis for sampling and regulatory requirements (aligned with BUDs) • Soil diversion percentage formula = (total estimated soil diverted from landfill / total estimated soil produced by project) x 100 • Monies received for recycling and/or salvaged materials remain with Contractor except for items specifically identified in contract documents	• SCOs under Disposal of Contaminated, Non-hazardous Materials and Waste are not aligned with NYS DEC BUD reuses, resulting in less than optimum recovery and reuse of excavated soil • Reuse generally is limited due to application of requirements on capital funding, which requires the item to last at least 5 years, which does not seem to apply to reuse in other agency WMPs. • Salvage missing from specifications and limited salvage is conducted by Parks Maintenance and Operations division to salvage above-ground items, such as benches and play equipment parts.

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Non-City Agency Waste Management Specifications		
	PANYNJ	SCA—Section S01524
Applicability	PANYNJ facilities similar to NYC roadway infrastructure projects	All projects Originally for Green Schools Guide so we could meet the LEED credit requirement, but for non-Green Schools Guide SCA not running calculations of the percentages Green Schools Guide is based on LEED, since SCA needs to be equivalent or more stringent; GSG Credits on Waste Management, the credits of which are based on the LEED V4 credits "Construction and Demolition Waste Management Planning" and "Construction and Demolition Waste Management"

Design Phase	• Perform material balance to identify material that will be disposed of and brought on site
	  ○ material estimates from Construction Waste Estimate by in house or consultants
	  ○ use CY as measure to support space planning and tonnage for disposal costs
	  ○ space planning is necessary for stockpiling needs and to inform scheduling
	  ○ including items that are reused directly in estimate through net cost may result in better bid
	  ○ more opportunities to reuse a material stream, the greater the financial savings due to upfront cost of processing equipment
	• Identify on-site reuse opportunities
	  ○ list of known opportunities to reuse materials
	  ○ soil reuse is ideally considered in construction phasing and staging to take advantage of opportunities
	  ○ concrete crushed on site can become RCA to be used in lieu of Aggregate Base Course (ABC) and Fines can be used for fill above water table to avoid interfering with groundwater pH; RCA can be used in lieu of ABC for temporary construction of roadways
	  ○ Asphalt Millings can be used as sub-base in locations with lower performance requirements (less loading)
	• Challenges
	  ○ on site processing—ensuring space on site for crusher may result in a better bid price; contractors like having an on-site crusher for concrete as they may get a better price for RCA and steel separately
	  ○ allocating space on or adjacent to project site, requires buy-in on incorporating best waste management practices as necessary cost
	  ○ earthwork movement synergies must be identified early in master planning process
	  ○ design staff lack of awareness that best waste management practices require planning and consideration	

Construction Phase	<u>Contractor</u> General requirements to remove and divert C+D Waste • ensure the contract work employs processes that generate the least amount of waste possible due to all causes including error, inaccurate planning, breakage, mishandling, contamination and other factors, and by practicing efficient C+D materials (def = includes building materials, packaging and debris from construction, renovation, repair and demolition operations) management to minimize waste disposal by landfilling, incinerating or thermally destroying • remove PANYNJ property all C+D Materials generated from the performance of the contract work, unless the material is deemed acceptable by the Engineer and approved for reuse on a PANYNJ construction site in accordance with the requirements of the contract or approved by the Engineer for stockpiling for future use by PANYNJ per contract requirements • prepare supporting documentation for removal tickets in the form of an EDD (Electronic Data Deliverable = an electronic file populated for the purpose of transmitting and reporting data that can readily be imported into a data management system (e.g., CSV file format with certain requirements), which shall be an aggregated files for all removal tickets • designate a C+D Material Management Coordinator to: ○ oversee, implement, monitor, track, prepare EEDs, and report on the status of the Contractor's MMP	Covers (1) recycling of non-hazardous demolition and construction waste and (2) disposal of non-hazardous demolition and construction waste Contractor responsible for recycling a minimum of 75% non-hazardous demolition and construction waste with a goal of reaching 95% Definitions • Construction waste: building and site improvement materials and other solid waste resulting from construction, remodeling, renovation or repair operations; includes packaging • Demolition waste: building and site improvement materials resulting from demolition or selective demolition operations • Disposal: removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities with jurisdiction • Recycle: recovery of demolition or construction waste for subsequent processing in preparation for reuse • Salvage: recovery of demolition or construction waste and subsequent sale or reuse in another facility Performance Requirements (note—all documents, 3 copies) • Salvage/recycle requirements: SCA goal is to salvage and recycle as much non-hazardous demolition and construction waste as possible including materials listed on Exhibit 4 <u>Waste Management Plan (WMP)</u>: Contractor to submit WMP within 14 days of Notice to Proceed

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

	○ train subcontractors, material suppliers and workers on waste management procedures consistent with the approved MMP • achieve a C+D material landfill diversion rate of 90 percent by weight of each of the following C+D material streams generated by the Work ○ asphalt ○ concrete ○ steel ○ aggregate base course ○ soil • achieve a C+D material landfill diversity rate of 75 percent by weight of the remaining C+D material streams not indicated above Contractor to deliver C+D Material Management Plan (MMP) within 7 days of issuance of Work Order and prior to Work commencement identifying • C+D Material Management Coordinator • material streams and estimated quantities anticipated to be generated by the work • means and methods of storing and/or segregating material streams on site, handling and packaging materials for off-site transportation, intended disposition methods, intended receiving facilities and transporters for each C+D material stream submitted to Engineer for approval per contract (with Engineer approval of facilities) • contractor's calculations showing that based on estimated quantities above the landfill diversion rates will be achieved • approval of a MMP does not relieve Contractor of responsibility for compliance, which require separate submission of information related/included in MPP and with applicable environmental regulations • MPP at minimum to include: ○ C+D Material Management Coordinator information ○ C+D Material Stream Identification, Quantification and Receiving Facilities information ○ C+D Material Management Means and Methods ○ C+D Material Documentation and Tracking Procedures ○ C+D Material Management Implementation and Monitoring • Contractor to submit monthly C+D Material Management Submittals in EDD format concurrent with each monthly payment request; failure to submit EDDs on monthly basis may result in withholding any payment per Engineer discretion ○ C+D Material Management Summary Progress Reports (detail not included) EDDs for Removed Materials (detail not included)	• General: WMP to consist of waste identification, waste reduction work plan, and cost/revenue analysis; separate sections for demolition and construction waste, indicating quantities by weight or volume, using same units of measure throughout WMP ○ *Default is that all money received by contractor to remain with contractor; if any money to go to SCA specification must revised to provide for that* • Waste Identification to indicate anticipated types and quantities of demolition, site-clearing and construction waste generated by work, including estimated quantities and assumption for estimates • Waste Reduction Work Plan to list each type of waste and whether it will be salvaged, recycled or disposed of in landfill or incinerator; include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures ○ For recycled materials include list of local receivers and processors and type of material they will accept plus contact information ○ For disposed materials indicate how and where materials will be disposed of plus contact information ○ For handling and transportation procedure include method of separating recyclable waste including sizes of containers, container labelling, and project site designated location for materials separation • Cost/revenue analysis indicates total cost of waste disposal as if there were no WMP and net additional cost or net savings resulting from implementing WMP including: total waste quantity; estimated cost of disposal per unit and including hauling and tipping fees and cost of collection containers for each waste type; total cost of disposal with no waste management; revenue from recycled materials; savings in hauling and tipping fees that are avoided; handling and transportation costs, including cost of collection containers for each waste type; net additional cost or net savings from WMP Waste Reduction Progress Reports: Concurrent with each application for payment, contractor to submit report with following information: material category; generation point of waste; total quantity of waste in tons or by volume; total quantity of waste recovered (salvaged plus recycled), both estimated and actual in tons or by volume; total quantity of waste recovered (salvaged plus recycled) as percentage of total waste Waste Reduction Calculations: Before Substantial Completion request, submit calculated end-of-project rates for salvage, recycling and disposal as percentage of total waste generated by work on form available on SCA website Recycling and Processing Facility Records in form of manifests and weight tickets for receipt and acceptance of recyclable waste by facilities licensed to accept them Landfill and Incinerator Disposal Records in form of manifests and weight tickets for receipt and acceptance of waste by facilities licensed to accept them Sustainability Submittal: Contractor to submit signed Construction Waste Certification Form (available on SCA website) tabulating total waste material, quantities diverted, and means by which diverted Statement of Refrigerant Recovery (not detailed) Implementation of WMP • General: Contractor to implement WMP as approved by SCA; provide handling, containers, storage, signage, transportation and other items as required to implement WMP during contract duration; comply with Section S01500 Temporary Facilities and Controls for operation, termination and removal requirements • Waste Management Coordinator: Contractor to designate site staff person(s) as waste management coordinator, who shall be present at project site full time for project duration, to be responsible for implementing, monitoring and reporting WMP status • Training: Contractor to train workers, subcontractors and suppliers on proper waste management procedures as appropriate for work on project site; distribute WMP to everyone concerned within 3 days for submittal return (approved WMP?); distribute WMP to entities when they first begin work on-site and review WMP procedures and locations established for salvage, recycling and disposal • Site Access and Temporary Controls: Contractor to conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways and other adjacent occupied and used facilities; designate and label specific project site areas necessary for separating materials to be salvaged, recycled, reused, donated and sold; comply with Section S01500 Temporary Facilities and Controls for controlling dust and dirt, environmental protection and noise control Quality Assurance: refrigerant recovery technician qualifications; contractor to comply with hauling and disposal regulations of authorities having jurisdiction; contract to conduct Waste Management Conference at project site • Waste Management Conference to review methods and procedures related to waste management including but not limited to: review and discussion of WMP including responsibilities of Waste Management Coordinator; review of requirements for documenting quantities of each type of waste and its disposition; review and finalizing procedures for materials separation and verification of container and bin availability needed to avoid delay; review procedures for

		periodic waste collection and transportation to recycling and disposal facilities; review waste management requirements for each trade Reuse of recycled concrete and/or masonry permitted in work in conjunction with Section 20260; such reuse is permitted as acceptable, at SCA option, for use in backfilling building demolition that will subsequently be removed as part of project or future project Recycling Demolition and Construction Waste-General: recycle paper and beverage containers used by on-site workers; recycling incentives, such as revenues, savings, rebates, tax credits and other incentives received for recycling waste material shall accrue to contractor; procedures include separating recyclable waste from other waste materials, trash and debris and separating recyclable waste by type at site to maximum extent practical by providing appropriately marked containers/bins for controlling recyclable waste until removed from site and including list of acceptable and unacceptable materials at each container/bin; stockpiling processed materials on site away from construction area and not within drip line of remaining trees, without intermixing with other materials by placing, grading, and shaping stockpiles to drain surface water and covering to prevent windblown dust; storing components off the ground and protecting from weather; removing recyclable waste off SCA property and transport to recycling receiver or processor Recycling Demolition Waste • Concrete: remove reinforcement and other metals from concrete and sort with other metals; pulverize to maximum of 4" size; crush concrete and screen to comply with requirements of Section 02060 Building Demolition • Masonry: remove metal reinforcement, anchors and ties from masonry and sort with other metals; pulverize to maximum of 4" size; crush masonry and screen to comply with requirements of Section 02060 Building Demolition • Asphaltic concrete: crush to size required by recycling facility; separate concrete debris from asphalt • Wood materials: sort and stack members according to size, type and length; separate lumber, engineered wood products, panel products and treated word materials • Metals: separate metals by type; stack structural steel members according to size, type of member and length; remove and dispose bolts, nuts, washers, and other rough hardware • Asphalt shingle roofing: separate organic and glass-fiber asphalt shingles and felts; remove and dispose nails, staples and accessories • Gypsum board: stack large clean pieces on wood pallets stored in dry location; remove and dispose fasteners • Acoustical ceiling panels and tile: stack large clean pieces on wood pallets stored in dry location; separate suspension system, trim and other metals from panels and tile and sort with other metals • Carpet: roll large pieces tightly after removing debris, trash, adhesive and tack strips; store clean, dry carpet in closed container or trailer provide by Carpet Reclamation Agency or carpet recycler • Plumbing fixtures: separate by type and size • Piping: reduce piping to straight lengths and store by type and size; separate supports, hangers, valves, sprinklers and other components by type and size • Lighting fixtures: separate lamps by type and protect from breakage • Electrical devices: separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers and other devices by type • Conduit: reduce conduit to straight lengths and store by type and size Recycling Construction Waste • Packaging: for cardboard and boxes, break down packaging into flat sheets and bundle and store in dry location; for polystyrene, separate and bag materials; for pallets, as much as possible require deliveries using pallets to remove pallets from project site and for those that remain on-site break down into component wood pieces and comply with wood recycling requirements; for crates, break down into component wood pieces and comply with wood recycling requirements • Wood materials: for clean cut-offs of lumber, grind or chip into small pieces; for clean sawdust, bag sawdust that does not contain painted or treated wood • Gypsum: stack large clean pieces on wood pallets and store in dry location; grind pieces of clean gypsum board using small mobile chipper or hammer mill; screen out paper after grinding Disposal of Waste • General: except for items or materials to be salvaged, recycled, or otherwise reused, contractor to remove waste from project site and legally dispose them in landfill or incinerator acceptable to authorities having jurisdiction; except as otherwise specified contractor not to allow waste materials that are to be disposed accumulate on-site; contractor to remove and transport debris in manner to prevent spillage on adjacent surfaces and areas • Burning waste materials prohibited • Contractor to transport waste materials off SCA property and legal dispose them

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

		Procedures describe “source separated” method for handling recycled waste; if space at project site is limited, SCA can revise this specification to allow “co-mingled” method, which takes less space because it permits all recyclable waste to be place in a single container separated later at recycling facility For projects involving work in an existing occupied building (such as related to an Addition project), contractor shall coordinate with SCA Industrial and Environmental Hygiene Department on requirements for storage, testing and disposal or recycling of demolition waste
Important Features	• 90 % diversion for enumerated items and 75 % for rest • EDDs for monthly C+D Material Management Submittals (removal tickets) • Monthly EEDs with payment requests and ability of Engineer to withhold payment if not submitted with payment request	• Waste management conference gets at means and methods details on site; special section on training in implementation • Submission of Waste Reduction Project Reports is concurrent with each application for payment • Implementation of WMP especially good with detail that reflects how a project works; see detail in Recycling Demolition and Construction Waste-General, Recycling Demolition Waste and Recycling Construction Waste • Cost/revenue analysis with net additional cost or net savings from WMP • Incineration permitted and not limited to facilities complying with European standards as compared to DDC spec for public buildings • Default assumptions that can be changed at SCA option : payments to contractor stay with contractor; “source separated” method

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

Exhibit 1

- Asphalt *
- Brick
- Corrugated cardboard
- Carpet
- Concrete *
- Film plastic
- Fluorescent lamps
- Glass *
- Land clearing debris
- Metal
- Pallets
- Roofing (asphalt)
- Wood
- Gypsum/wallboard *
- Rigid foam insulation
- Appliances
- Architectural features *
- Circuit breakers
- Office furniture
- Windows*/doors*
- Wood timbers *
- * Excavated soils

(* denotes materials identified in CLCPI)

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

Exhibit 2

- Concrete*
- Bricks
- Concrete masonry units (CMU)*
- Asphalt*
- Metals (banding, stud trim, ceiling grid, ductwork, piping, rebar, roofing, other trim, steel iron, galvanized, stainless steel, aluminum, copper, zinc, brass, bronze)
- Clean dimensional wood*
- Carpet and pad
- Drywall*
- Ceiling tiles
- Cardboard, paper and packaging
- Reuse items indicated on Contract Documents and/or elsewhere in Specification

(* denotes materials identified in CLCPI; excavated soil included in CLCPI)

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

Exhibit 3

2003 DDC CDW Manual Principles

Public Buildings

DDC Design Project Manager

- Make sure that specifications for all projects include a C+D Waste Specification; if a LEED project minimum diversion requirement either 50% or 75%; if not LEED project choice between overall 50% diversion of 80% recycling goals for each major building material
- Ensure that project's C+D waste management goals are aggressive and a C+D Waste Management specification is developed for the project to become part of bid package
- Start early (schematic design phase) to identify opportunities (including from existing conditions related to demolition activities) for salvage and/or recycling—demolition and renovation projects offer considerable opportunities for salvage, reuse and recycling
    - Existing furnishings and equipment in good condition for reuse in project or other DDC project or donation
    - System components and equipment (chillers, ductwork and lighting) with reuse potential but weighed against other sustainability performance criteria
    - Architectural components (e.g., doors, paneling, shelving, wood, stone/marble, re-lamped lighting fixtures, windows in consultation with sponsor agency and weighed against function, location, ease of removal and storage
- Instruct design team to make strategic design decisions that prevent waste during construction as well as over life of building
- Instruct design team to focus on following materials based on existing market conditions (list in Exhibit 1)
- Review and discuss waste management goals as part of design progress meetings
- Waste prevention strategies (entire design team)
    - Flexible design to anticipate change: easy technology upgrades with accessible, organized wiring and expandable systems (e.g., cable trays and raised floors); choose modular sizes for interior rooms to reduce renovation frequency and extent; group built elements together in office settings to enable maximum flexibility for open work area and work station changes; design flexible mechanical systems considering building management systems, point of control and monitoring, maximizing zoning and system modularity
    - Detail with material economy and waste recycling in mind: design to standard materials sizes as much as practical to avoid cut-off waste; consider prefabricated components (manufacturer likely to control and recycle waste); use durable and low maintenance materials; choose materials with recycled content; select materials, building components and furniture from manufacturers that use minimal packaging or will take it back
    - Anticipate future changes: use mechanical fasteners to join materials rather than glue and choose manufactured components without fused materials; select materials that can be later recycled; require components to be labeled in construction to make modifications easy and prevent unnecessary replacement and exploratory demolition
    - Consider limiting the level of variety in details and materials for interior finishes and fixtures to prevent waste from partial orders and damaged attic stock: identify areas of special emphasis where variety and non-standard components may be important and use a modest range of materials elsewhere; while choosing a variety of lighting fixtures limit the types of lamps they require; use standard colors and finishes for heavy use or large typical areas; use modular components to make repair and replacement easier
    - Specify materials with recycled content
    - Produce complete construction documents: dimension and detail construction drawings to level sufficient for contractor to accurately estimate materials; take time on renovation projects for accurate field survey to minimize surprises; specify mock-ups of tricky details/situations where aesthetics or system coordination might dictate change; document the as-planned decisions in addition to as-builts and record the flexibility designed into the building for building management (e.g., spare capacities, operation and flexibility in systems controls, modular systems uses, areas where HVAC can easily support additional rooms, materials and finishes used and supplier of specialty items

DDC Construction Project Manager

- Work with/assist Contractor to develop an aggressive written Waste Management Plan (WMP) in accordance with C+D Waste Management specification developed by design team that identifies components to be recycled, reused/salvaged and landfilled; estimated amounts, processors to receive C+D waste; onsite procedures and responsibilities; a on-going reports to be provided
    - project walk-through of the site with the construction team, including demolition/excavation contractor, could help in determining materials to be salvaged or recycled
- Discuss waste management at all job meetings
- Review all periodic reports (and forward to DDC Public Buildings Office of Sustainable Design for agency-wide analysis) in a timely manner to assess Contractor performance based on C+D Waste Management specification requirements and approved WMP; compare periodic reports to WMP and bring lagging results to Contractor's attention
- Be firm, but flexible about real construction difficulties but keep both waste management and use of quality materials as priorities during construction and resist their abandonment due to schedule pressures, value-engineering or contractor coordination issues
- Schedule regular walk-throughs and prompt inspections to catch problems early, which will prevent waste and ease coordination between trades
- Collect information from design team about plans for flexibility and future waste prevention measures (e.g., space capacities, modular components) and pass them on to building's management post-construction

Contractor

- Develop a WMP
    - Designate a Recycling Coordinator to develop and monitor WMP
    - Analyze anticipated demolition and construction waste (possible information from other contractors, prior project waste disposal records, bid material estimates)
    - Target first materials that are plentiful, easy to recover and with low recycling costs or high paybacks
    - Identify products that manufacturers will pick up and recycle
    - Determine waste processors, considering costs, procedures, convenience etc. and whether they will pick up materials from job site
    - Plan on-site procedures for the WMP that includes the following strategies
- Strategies for on-site procedures for WMP
    - Prioritize source separation to collect recyclables in separate containers to go to processor for specific materials: determine available space and prioritize containers; concentrate of key materials to be source separate based on ease, value and abundance; question processors about procedures, waste hauler arrangements and pick up policies
    - Augment separation with mixed waste recycling for site constraints (documentation from mixed waste will likely report only average recycling rate); determine what constitutes an acceptable mixed load; prevent contamination of recyclable items
    - Encourage and train construction team members tailoring training to work being done; updating team on changes in procedures or location throughout project; consider motivational techniques/incentive
    - Fight contamination to keep everyday trash and disparate materials out of recycling bins: understand waste processor requirements and what constitutes contamination; place general trash containers adjacent to each recycling container/location and empty trash containers regularly; use small-wheeled containers for local collection to be periodically consolidated into larger containers; keep street-side recycling containers securely covered when not supervised; designate a separate lunch area
    - Monitor and collect paperwork: collect paperwork for all C+D waste; keep ongoing log record of weight ticket and receipt information and organize hem by specific items in WMP to make tallies easier; monitor recycling progress periodically and compare recycling rate to WMP and Waste Management specification; plan for little higher amount than specified so that final rate is sufficient
    - Buy recycled products when they meet specifications; use recycled materials for job site uses (e.g., temporary construction, office supplies, collection container); consider wide range of commonly available recycled products (drywall, steel products, insulation, concrete/concrete products, fiberboard, plastic lumber, roofing and flooring)

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

○ Prevent waste on jobsite: order materials accurately and as needed; protect materials from multiple handling, weather conditions, theft, and damage from construction activities; reuse materials on site if approved by architect (e.g., mulch from land clearing, debris/wood, crushed rock aggregate); maintain quality control and coordination to minimize rework with communication, schedule coordination and prompt inspections ○ Review for salvage before demolition (selective demolition) to yield usable building products for the project, for repairs on other projects or for donation, including architectural elements (railings, doors, decorative elements, divided light windows, flooring, stonework, other structural elements)	
• Waste prevention strategies embedded in design phase • Contractor-relevant detail on jobsite WMP activities	

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

Exhibit 4

1. Demolition Waste:

    a. Concrete.
    b. Concrete reinforcing steel.
    c. Brick.
    d. Concrete masonry units.
    e. Asphaltic concrete
    f. Synthetic Turf
    g. Wood studs.
    h. Wood joists.
    i. Plywood and oriented strand board.
    j. Wood paneling.
    k. Wood trim.
    l. Structural and miscellaneous steel.
    m. Rough hardware.
    n. Roofing.
    o. Insulation.
    p. Doors and frames.
    q. Door hardware.
    r. Windows.
    s. Glazing.
    t. Metal studs.
    u. Gypsum board.
    v. Acoustical tile and panels.
    w. Carpet.
    x. Plumbing fixtures.
    y. Piping.
    z. Supports and hangers.
    aa. Valves.
    bb. Sprinklers.
    cc. Mechanical equipment.
    dd. Electrical conduit.
    ee. Copper wiring.
    ff. Lighting fixtures.
    gg. Lamps.
    hh. Ballasts.
    ii. Electrical devices.
    jj. Switchgear and panelboards.

2. Construction Waste:

    a. Masonry and CMU.
    b. Lumber.
    c. Wood sheet materials.
    d. Wood trim.
    e. Metals.
    f. Roofing.
    g. Insulation.
    h. Carpet and pad.
    i. Gypsum board.
    j. Piping.
    k. Electrical conduit.
    l. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
        1) Paper.
        2) Cardboard.

3) Boxes.
4) Plastic sheet and film.
5) Polystyrene packaging.
6) Wood crates.
7) Plastic pails.

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

Exhibit 5

Acoustical tile and panels

Aluminum

Asphalt

Bricks

Bronze

Cardboard

Carpet/carpet pads

Cast iron

Cement

Ceramic

Clean dimensional wood

Concrete

Concrete masonry units (CMU)

Copper wiring

Electronic waste

Electrical wires

EPDM rubber

Equipment

Extruded polystyrene

Fencing

FRP

Glass

Grout

Gypsum

HDPE

HVAC/Ductwork

Land clearing debris

Lighting

Mercury containing light bulbs

Metals from rebar, sheetrock studs, framing, etc.

Paints, solvents, and other hazardous fluids

Piping

Plastics

Plumbing fixtures

Plywood

PVC

Recyclable office wastes such as paper and toner and ink cartridges

Comparative Waste Management Practices to Support Increased CDW Recovery and Reuse (Hazardous Waste Provisions Excluded)

Roofing

Sprinklers

Steel

Stone

Stucco

Terracotta

Valves

Wood