



Annex 4 - Construction activity pollution prevention

Enabel in Palestine

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Public works contract for the 'Construction of Al-Bakri Green Girls' School in Hebron'

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1. General

TS-1 Contractor shall be responsible for compliance with Construction activity pollution prevention mandatory requirements as specified in the PGBC guidelines. This includes:

- Studying charts of surface water and groundwater and making sure not to damage any of them during the process of construction or operation of the building by reference to the authority of Water and Irrigation OR Health and Environment Department of the municipality. No building materials will be dumped in the nearby Wadi, nor will any remains of cement, concrete or any other materials be allowed to be driven by storm water to this Wadi.
- Storm water shall be managed during all phases of construction so as not to impact adjacent properties and/or any public right-of-way and in accordance with any approved Grading and Storm water Management Plan.
- Resource protection must be carried out at the site so as not to contaminate surface water or groundwater. Prevention of on-site soil erosion and protect soil sites during the construction process. Vehicle cleaning, concrete pumping and cleaning of remaining quantities of concrete at the end of concrete pumping cannot be done at the site or at nearby areas if it contaminates soil or surface water. It is recommended to have a clear strategy to use these remaining materials for useful applications such as filling of cavities in the roads or any other application as approved by the engineer.
- Installation of equipment for reducing the number of gases emitted from vehicles work at the site and reducing the amount of dust and noise and light pollution during the construction process. This may require covering all building materials such as fine aggregates, spraying water on fine soil in the site or roads used by cars and other machines. If noise levels created by some of the activities reaching nearby buildings or residents are higher than that allowed by the Palestinian Environment Protection Authority (see tables below), then the use silencers or barriers to reduce noise transmission is required.

TS-2 Outdoor admissible noise levels as to the PSI (PS) 840-2005

Outdoor Conditions	Maximum (dB)	
	7:00 am to 8:00 pm	8:00pm to 7:00am
Rural Residential, Recreational, Schools, Hospitals	40	30
Residential Areas in Urban Centers	50	40
Residential in Commercial Centers and Public Roads	55	45
Commercial Areas	65	50
Industrial Areas	75	65
Public Parties and Conventions	85	75

TS-3 Admissible time subject to noise levels (MoL No. (4) Year 2005)

Noise level (dB)	85	90	95	100	105	110	115
Time per day (hr)	8	4	2	1	0.5	0.25	0.125

TS-4 Do not use drinking water on the site, but for the purpose of drinking or bathing or the concrete works. Recycled water or storm water must be used for construction, cleaning and spraying for dust suppression whenever possible.

TS-5 Raise awareness about the use of drinking water at the site only for the purposes mentioned earlier.

1.1 List of action submittals to be issued for Engineer approval

1. Action plan for Soil Management and rehabilitation of the site.
2. Integrated plan for the management of construction waste through sorting and re-use or recycling.
3. Site Maintenance Plan Worksheet.
4. Construction waste management plan.
5. Environmental Protection Plan

2. Action plan for Soil Management and rehabilitation of the site

TS-6 A Soil Management and Site Rehabilitation Plan for all areas of exposed soil created by the construction must be developed. .

TS-7 The interval between clearing, soil stabilization and replanting should be kept to an absolute minimum.

TS-8 Areas of exposed soil must be stabilized progressively as work is completed.

TS-9 Adequate stabilization must be maintained until plant cover is established.

TS-10 The Soil Management and Site Rehabilitation Plan must include the following:

- Type of soil stabilization to be used on disturbed areas
- Location of on-site replanting (if applicable), indicating the species and number to be used and approximate area (in square meters) of ground cover species
- Schedule of works to undertake:
 - Soil stabilization
 - Planting
 - Maintenance and extent of monitoring and follow-up work on site.

3. Integrated plan for the management of construction waste through sorting and re-use

3.1 Description of Construction Waste Management Plan (CWMP)

- TS-11* It is a plan that provides an overview of construction and demolition waste management practices associated with the construction of the Green Building. It should be prepared in accordance with the requirements of the contract specifications and the Palestine Higher Green Building Council.
- TS-12* The contractor will take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. **The contractor will assign a PGBC coordinator, who shall be responsible for instructing workers and overseeing and documenting results of the Waste Management Plan (CWMP) for this project.**
- TS-13* CWMP in this project will cover all construction materials that may be wasted, sorted, reused or recycled. The contractor needs to identify the target materials. These materials include, but are not limited to, the following:
- Brick/hollow block
 - Metal (ferrous & non-ferrous)
 - Paper and paper sacks
 - Cardboard
 - Gypsum Drywall
 - Asphalt Pavement
 - Concrete
 - Paint
 - Insulation
 - Wood
 - Glass
 - Tile and masonry
 - Beverage containers
 - Acoustic tiles
 - Carpeting
 - Aggregate products (dirt and other earthen materials)

3.1.1 Means and methods for diversion

TS-14 There are two different approaches to recycling construction and demolition waste: separating materials at the source (on-site), mixing them and sending them to an off-site waste sorting facility (Remote separation). Some of the key issues and considerations of each option are listed below.

3.1.1.1 A- On-Site Separation

TS-15 On-site separation refers to the sorting of construction waste on-site for delivery to a recycler. According to this strategy, separate material bins should be located at the site for recyclables. The general contractor is responsible for:

- Verifying that all sub-contractors are sorting construction waste from their own activities.
- Providing bins or containers and maintaining them as part of daily cleaning.

3.1.1.2 Remote Separation (off-site)

TS-16 In this scenario, an independent recycler owns a materials recovery facility (MRF). Typically, an independent recycler underbids a garbage hauler. The independent recycler takes containers of construction waste from the site to recycler's own plant where separation takes place.

TS-17 In this case, the owner and Engineer must be satisfied that such a firm has a proven track record of recycling in this manner and has the resources required to satisfy the contract requirements. This is a serious issue that often justifies an audit. All participants should be aware of the increased possibility of contamination.

3.1.2 CWM Reporting

TS-18 A CWM specification should identify CWM expectations, set diversion goals, and define how CWM will be audited:

3.1.2.1 Site Separation

TS-19 For on-site separation projects, the contractor would be required to generate a form with weight tickets (which will include the following : Date, Work Order Number, Percentage of Each Material, Percentage of Waste to the Landfill and Total Tonnage), signatures, receipts and invoices and other forms of validation that reflect the kind and amounts of materials that have been recycled. This information should be provided as monthly reports and a final report.

3.1.2.2 Remote Separation

TS-20 For remote-separation projects, the recycler should be able to define general percentages of materials as well as their weight. To better facilitate future programs, it is important to quantify and qualify recycling efforts, thereby reinforcing successes and defining failures.

3.1.2.3 Municipality Ordinances

TS-21 The municipality has established ordinances to control construction and demolition waste. The municipality requires that each project submit a waste management plan (WMP) detailing how that project will divert a specific

percentage of its materials from the landfill. Applicants for building or demolition permits involving any Covered Project shall complete and submit a WMP, on a WMP form approved by the municipality for this purpose as part of the application packet for the building or demolition permit. The completed WMP shall indicate all of the following:

- The estimated volume or weight of project debris, by materials type, to be generated.
- The maximum volume or weight of such materials can feasibly be diverted via reuse or recycling.
- The vendor or facility that the Applicant proposes to use to collect or receive that material.
- The estimated volume or weight of materials that will be land filled.

3.1.2.4 Project Team Coordination

TS-22 The single most effective way to ensure success with a construction waste management program (CWMP) is through communication. This can be achieved by including the following communication components:

1. **On-Site CWM Coordinator:** An on-site CWM operations coordinator should be appointed. His responsibility should include verifying conformance with the CWM plan, coordinating proper emptying of containers, and resolving any related issues.
2. **Distribution Plan:** Since the CWM plan may affect any department during its' implementation, the CWM plan should be distributed to all levels of management. People who are informed about a policy early in its deployment are far more likely to become invested in its successful outcome.
3. **Awareness (preconstruction meeting):** Because different groups of people will be working at the site throughout the project duration, it is important that a formal educational presentation of the CWM program be given to all contractors - including subs - prior to their admittance to the job site. The On-Site CWM Manager should review the container locations and relevant sorting procedures with all workers.
4. **Signs:** Signage throughout the job site will help increase recovery rates of waste materials. Signs can be used to direct worker's attention to the appropriate Construction policies, the location and use of the collection receptacles, and the recovery progress to date.
5. **Monitoring:** The On-Site CWM Operations manager should verify that all team members are sorting their recyclables properly. The success of any recycling program depends on usable recovered materials.

TS-23 After contracts are established with subcontractors, each subcontractor will be delivered a Palestinian Green Building package. This package will contain general information about the processes and procedures of the project, including waste management and recycling. Efforts will be made by sustainability consultant to meet with as many subcontractors as possible for subcontractors to gain information from other subcontractors, aiding in coordination of the waste

management program. Items to be discussed at the meeting shall include the following:

- Summary of PGBC
- Target Materials to be Recycled
- Task Requirements/ Documentation of Efforts
- Job Site Clean Up
- Progress Reporting

TS-24 Each subcontractor is expected to make sure all their crews comply with this Waste Management Plan. Additionally, waste prevention and recycling will be discussed at the beginning of each subcontractor orientation meeting, safety orientation meetings and weekly field meetings.

4. Site Maintenance Plan Worksheet

4.1 Site Maintenance Plan Requirements

- TS-25* Accumulated construction debris shall be hauled away and disposed of in accordance with all applicable laws, on a regular basis, but no less than one time per week. Any debris temporarily stored on site must be stored and secured to prevent a safety risk or danger.
- TS-26* All construction sites must be enclosed with a 1.8m tall chain link fence. A “No Trespassing” sign shall be mounted on the fencing in conspicuous locations around the site until construction is completed. Any gate in a perimeter fence shall be adequately hinged to prevent entry, except to allow ingress and egress to and from the site. Such gate must be always locked, other than permitted hours of construction.
- TS-27* All mud, dirt or debris deposited on any street, alley, crosswalk, sidewalk or other public property because of construction shall be removed and broom cleaned to the extent possible at the end of each day that construction work has occurred.
- TS-28* Except as delivery or removal of materials to and from the construction site is occurring, to the extent any sidewalk, street or other public right-of-way should be blocked or closed.
- TS-29* Portable toilets shall be required at every construction site prior to the commencement of construction, unless an existing facility is available on site. Portable toilets shall be located to the extent possible at the rear of the site and out of plain view of any public right of way. Portable toilets should be provided no less than once a week.
- TS-30* Routes of access for ingress and egress to the construction site, which will provide protection to pedestrians and minimize disruption of traffic and damage to the public rights-of-way, shall be followed.

- TS-31* The parking of construction personnel vehicles shall not occur in any manner so as to block access to or through any public alley, sidewalk, or street. All uses of vehicles shall also comply with applicable regulations related to parking and time of operation of vehicles.
- TS-32* All trees and other vegetation on the public right-of-way shall be protected from damage by means of appropriate fencing. Fencing trees on the public right-of-way should be placed to protect the critical root zone.

5. Construction waste management plan

- TS-33* Contractor shall be responsible for compliance with Construction and Operation Waste Management mandatory requirements as specified in the PGBC guidelines.
- TS-34* The General contractor and all subcontractors must develop a Construction Waste Management Plan (CWMP) prior to the start of construction activities. The CWMP must identify the materials to be diverted from landfill and indicate whether the materials will be segregated on-site or commingled. If materials are planned for salvage, the plan must indicate their planned use.
- TS-35* The Contractor must implement monthly monitoring of the CWMP and achieve a minimum final recycling/salvage rate of 30% of construction and excavation waste (by weight or volume). This figure excludes all hazardous waste that must undergo specialized treatment.

5.1 List of action submittals to be issued for Engineer approval

1. CWMP conforming to the Credit Requirements (before starting the work).
2. Schedule of items to be recycled/salvaged, their source within the project, their total estimated weight or volume and the name and location of potential reclaim/ recycling haulers.
3. Calculations, supported with detailed receipts, summarizing results of the CWMP activities listing items recycled/salvaged, their source within the project, their total weight or volume, the name and location of the reclaim/recycling haulers.

6. Environmental Protection Plan

6.1 Access and Access Roads

- TS-36* Potential environmental impacts associated with the construction and operation of access roads include: soil erosion and compaction, , contamination of soil and groundwater, disruption of surface and sub-surface drainage patterns, changes to soil moisture and fertility, edge effects on plants adjacent to cleared areas, deposition of airborne road dust and airborne emissions from vehicles and construction equipment, accidental fires, salvage and disposal of timber, noise and aesthetics.

TS-37 The following describes practices that will be followed to minimize potential environmental impacts during access road construction, operation and decommissioning.

1. Vehicles, machinery and pedestrian traffic will be restricted to project related access routes and cleared project sites.
2. Contractors will wash equipment, machinery and tires at their point of origin prior to transport to the project areas to minimize the risk of invasive plant introduction or spread. (i.e. purple loosestrife from the southern part of the province.)
3. Oil or petroleum products shall not be used to control dust. Water or approved dust suppression products will be used to control dust on the access road.
4. Temporary access routes and associated stream crossings may be decommissioned at the completion of the construction phase according to specification requirements and shall be approved by the Engineer.
5. Ongoing visual inspection of the worksite will be conducted by the Project Sustainability consultant to ensure adequate restoration and minimal environmental degradation.

6.2 Borrow Pits and Excavations

TS-38 Environmental impacts of excavation pit developments can include the loss of trees, erosion, dust, soil/groundwater contamination, waste disposal, noise, and aesthetics.

TS-39 The following section describes practices that will be followed to minimize potential environmental impacts associated with excavation and borrow pits:

1. All garbage, debris, or refuse shall be stored in covered containers and removed to licensed landfill sites. Garbage, debris or refuse shall not be discarded into the excavated areas.
2. Before excavation starts in pits, runoff control measures shall be designed to redirect surface runoff away from access routes and pit and quarry walls.
3. Organic material, topsoil, and subsoil will be striped and piled for future site rehabilitation.
4. To encourage revegetation, the organic layer will be segregated from other overburden soils and will be replaced on pit slopes and bottoms after borrow material has been removed from sites designated for decommissioning.
5. Site clearing shall be minimized within the context of permitting the safe and efficient movement of personnel, material and equipment, during the excavation of materials.
6. Washing and maintenance of vehicles and equipment in the excavated area shall not be permitted.
7. Signs will be posted to warn unauthorized personnel of safety hazards.

8. Appropriate drainage and erosion control measures shall be implemented for borrowing sites which are no longer needed.
9. The contractor should implement erosion and dust control measures on site.
10. Oil and grease changes on any vehicles will be prohibited in pits.
11. All waste, refuse, structures, material and equipment shall be removed by the contractor at the end of construction.

6.3 Stripping and Grading

- TS-40* Stripping involves the removal of topsoil and low vegetation to mineral soil. Grading is the process of reshaping the land to design elevations.
- TS-41* Potential environmental impacts associated with stripping and grading include erosion, loss of plants and trees, and sedimentation of waterways.
- TS-42* The following section describes practices that will be followed to minimize potential environmental impacts during stripping and grading.
1. Erosion control measures, if required, should be in place prior to stripping.
 2. Whenever possible, stripped material will be segregated and stockpiled for later use in backfilling.
 3. Soil striplings shall be stockpiled in a manner that will not impede natural drainage and will remain available to rehabilitate disturbed sites. Depending on the condition of the soil at the time of rehabilitation and the planned future use of the site, the stockpiled soil will be replaced upon completion of project activities.

6.4 Concrete Mixing Areas

- TS-43* The concrete mixing areas for the project will be in the Contractor's work area. It will supply concrete for the duration of the project.
- TS-44* Potential environmental impacts associated with concrete mixing areas include the potential for wastewater containing sediment, a high PH or petroleum contamination to enter waterways or soil, dust, and waste generation.
- TS-45* The following section describes practices that shall be followed to minimize potential environmental impacts at the campsite.
4. Dust control at the mixing area and aggregate storage areas may include tree or fence barriers and water dampening.
 5. Contaminated and clean storm water should be kept separate with dedicated storm water systems.
 6. If possible, water used in the truck washout area will be collected and reused for washing.
 7. The contractor will inspect the water storage area daily and immediately after rainstorms to ensure the capacity has not been exceeded and flow has not been obstructed.

8. Reuse waste concrete whenever possible.
9. Fuel and chemicals shall be stored in a dedicated storage area with appropriate spill response equipment available.

6.5 Incident Reporting Form

Date_____

Name of Environmental Inspector _____

Weather Condition :

Temperature:	☐ cold	☐ moderate	☐ hot	
Humidity:	☐ low	☐ moderate	☐ high	
Clouds:	☐ clear	☐ partial	☐ overcast	
Wind speed:	☐ low	☐ moderate	☐ windy	
Rain :	☐ Dry	☐ light showers	☐ Heavy rain	☐ Snow

Incident to Report (who, what, when, where)

Outcome of Incident (Include who reported to and suggestions for future)

Signature_____