Section 6 - ANNEX A

Conceptual Perspectives

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Exterior Color Scheme 1

Section 6 - ANNEX A

Conceptual Perspectives

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Exterior Color Scheme 2

Section 6 - ANNEX A

Conceptual Perspectives

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Exterior Color Scheme 3

Section 6 - ANNEX A

Conceptual Perspectives

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Exterior Color Scheme 4

Section 6- ANNEX A

Conceptual Perspectives

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Interior Design Concepts

Section 6- ANNEX A

Site Photos for the New Innovation Center

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Section 6- ANNEX A

Site Photos for the New Innovation Center

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

Section 6 - ANNEX B

Space Matrix for the New Innovation Center

RTC-Agusan Del Norte, Caraga

Approx. Site/Lot Area: ± 2,273.00 SQ.M

Subject for detailed survey, site clearing / intervention, tree cutting, embankment

	SPACE	APPROX. GROSS FLOOR AREA (±) SQ.M	PRIMARY USE	PROPOSED VERTICAL ROOM CLEARNCE / HEIGHT (Meters);	GENERAL DESIGN CONSIDERATIONS
	GROUND FLOOR				
1	**LOBBY SHOWCASE & DISPLAY ZONE**	100.00	Reception area, lounge chairs/sofa, tables and kiosks, display area	6.00	Convenience and Data Outlets, Wi-Fi
2	**MULTI-DISCIPLINARY FABRICATION WORKSHOP**	454.00	Maker Space, 3D Printers, Work Benches, Staff Work Area, Laser Cutter, Stairs for Mezzanine Floor; Staging Area, Workshop Area, Arc Welding Booth,Compressor Vaccum, Lathe, CNC, Hand Tool and Work Bench, Drill Press, Metal Bender, Router, Milter Saw, Delivery Area with Roller Shutters	6.00	Convenience and Data Outlets, Wi-Fi, Mobile TV Screen, Exhaust and Drainage provisiosn., Emergency Eye Wash, See Equipment List, Large Fans, Heavy Floor Load Capacity, Air-Conditioned and/or combination with large utility fans.
3	**FISH CULTURE PROCESSING FACILITY**	97.00	State-of-the-art facility within the innovation center, designed for the efficient and sustainable processing, preservation, and packaging of cultured fish products.	6.00	Efficient workflow, hygiene and safety standards, temperature control, waste management, and integration with advanced processing technologies
4	**COLD STORAGE ROOM**	64.00	Ensures the preservation and safe storage of processed fish products at controlled temperatures	3.0-3.50	Design considerations for a cold storage room include insulation, temperature control systems, proper ventilation, moisture control, efficient drainage, and energy-efficient lighting.
5	**UTILITIES/ STORAGE (Under Stairs)**	25.60	Storage Area, Utility Room for Electrical/ Auxiliary, Plumbing	3.00	Electrical, Auxiliary, Mechanical and Plumbing
6	**PWD/ ALL-GENDER RESTROOM @ LOBBY**	3.96	PWD / All-Gender Restroom	3.00	Waterclosets, Lavatory, Grab bar for PWD, Dryer, Mirror, Infant Changing Table (Foldable)
7	**RESTROOMS**	43.00	Male, Female, PWD / All-Gender Restroom	3.00	Waterclosets, Urinal, Lavatory, Grab bar for PWD, Dryer, Mirror, Slop sink, Lokcer Cabinets
	MEZZANINE - GROUND FLOOR				
8	**ELECTRONICS, IOT AND ROBOTICS LAB**	15.00	Work Tables, Chairs, Laser Cutter, Glass Boards	3.00	See Equipment List, Convenience and Data Outlets, Air-Conditioned, Convenience and Data Outlets, Wi-Fi
9	**UTILITIES/ SERVERS, STORAGE**	61.00	Storage Area, Utility Room for Electrical/ Auxiliary, Plumbing	3.00	Electrical, Auxiliary, Mechanical
	SECOND FLOOR				
9	**CO-WORKING SPACE**	440.00	Shared pantry with collaboration spaces, movable furniture (modular working tables and chairs), small meeting/phone call booths	4.00-5.00	Convenience and Data Outlets, Wi-Fi, Mobile TV, Glass Boards, Air-Conditioned, Heavy Floor Load Capacity
10	**INCUBATION ROOMS**	86.00	7 -small incubation rooms; 1- Large incubation room	4.00-5.00	Convenience and Data Outlets, Wi-Fi, Mobile TV, Glass Boards, Air-Conditioned
11	**ELEVATOR LOBBY WITH SHOWCASE / DISPLAY AREA and CAFÉ**	100.00	Open space for kiosks, tables, lounge	4.00-5.00	Convenience and Data Outlets, Wi-Fi, Air-Conditioned
12	**MEETING ROOM**	92.00	Meeting/Conference room for 12-15pax.	4.00-5.00	Convenience and Data Outlets, Wi-Fi, Air-Conditioned, Mobile and Fixed TV/Smart Screen, Glass Boards; Air-Conditiioned
13	**RESTROOMS**	43.00	Male, Female, PWD / All-Gender Restroom	2.70	Waterclosets, Urinal, Lavatory, Grab bar for PWD, Dryer, Mirror, Slop sink, Waterproofing
	CIRCULATION SPACES, MISC				
14	**STAIRS, ELEVATOR/LIFT, ELEVATOR LOBBY, FIRE EXITS, WALLS**	375.44		-	Machine Room-less Elevator for lift, see material specifications
	ROOF				
15	**DECK**	Varies	Space for Utilities, Waterproofing (check general specifications), Other Areas shall be with roof	-	Solar Panels, Additional Utility Rooms, Area for ACU Outdoor Units / Condenser Units, Roof Garden
	APPROX. TOTAL (±) SQ.M	**2,000.00**			

Note: To follow Standard Philippine Codes on Design, Construction, Accessibility Fire Proection & Utilities
Spaces shall be ready for use and occupancy of employer/ TESDA, Refer to Equipment List for other information

Section 6 - ANNEX C

BRANDING

EXTERIOR AND INTERIOR

GENERAL NOTE (ENTIRE SECTION 6-ANNEX C) : The images provided serve solely for reference purposes, and it is essential to clarify that there is no intention to claim ownership or authorship of the design depicted in these visuals. Their inclusion is solely for informative or illustrative purposes, aiming to provide additional context, elucidate concepts, or offer visual examples to enhance comprehension. This disclaimer is crucial to prevent any misunderstanding regarding the origin or proprietary rights associated with the showcased design elements. Rest assured, the use of these images is strictly for reference, and no claim is made regarding their design or intellectual property.

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
TESDA logo	To be placed at the façade, main lobby and elevator lobbies   	Variations / Creative incorporation of TESDA logo. For Approval of TESDA
Graphic Walls	Interior lobby. Science and Technology Theme. Abstract or Silhouttes  	Combination of Blue, White, Gray
Carpet Tiles	 	Combination of Blue, White, Gray
Typography, Signages / Wayfindnig	     	Example of Fonts: Helvetica, Arial or minimalist. Accent colors on walls and floors thru heavy duty paint. Directional signs and room labels on glass frostings.

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

EXTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Cladding / Façade Treatment (Accent Walls/ Featured walls)	Optional Material for Accent Walls only; Aluminum Composite Cladding 	Structural performance: provide exterior/interior wall cladding assemblies capable of withstanding the effects of load and stresses from dead loads, wind loads, and normal thermal movement without evidence of permanent defects and stains of assemblies or components. Sealed joints shall allow free and silent movement of panels during expansion and contraction while preventing uncontrolled penetration of moisture Submit shop drawings and samples for approval
Walls (Interior and Exterior)	Combination of Cement finish with masonry coating/sealer and Painted Finish (Acrylic Solvent-based paint on colored areas. 	Walls shall be made of pre-cast / pre-fabricated walls. Lightweight, higher compressive strenght, sound insulation, fire, water and moisture resistant. Finishes shall be a combination of limewash and wall paint (acrylic solvent-based coating). Accent walls should be combination of colors blue and wood veneers. Employer/ TESDA approved color for other areas.
Waterproofing for roof decks and canopies	Two or multiple component, flexible cementitious waterproofing membrane.	Contractor to conduct a demo before actual application and/or approval. Minimum warranty of five (5)
Curtain Walls, Windows and Glass Doors	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. Powder-coated aluminum framing; Employer-approved color / shade. For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction. 	Contractor to submit shop drawings and samples for approval of employer / TESDA
Roofing (for selected areas)	Ga. 24 Pre-Painted Rib-type/corrugated roofing with double sided roof insulation (polyethylene foam): Gauge of Sheeting Spacing of Laths 26 450 mm – 600 mm 25 600 mm – 750 mm	Can withstand Signal 4-5 typhoons.
Exterior Flooring	Non-Skid Cement tiles (80cmx80cm or larger) and pavers 	Contractor to submit samples for approval. 2.0mm max grouting width should and match the color of the tiles..
PWD Ramp	Refer to BP 344	Stainless Steel Railiig, Tactile Blocks
Canopies (Glass)	High Impact, wind load resistant and translucent glass canopies with structural framing. Complete with structural framing and sealants	Toughened, laminated glass, shatter proof and has a high tensile strength to protect against cracking and breaking.
Louvers (Sun-Shading)	Aluminum Louvers 	Can withstand Signal 4-5 typhoons. Complete with framing and accessories. Check angle and position with the building orientation

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Lobby, Lounge, Hallway / Corridors, Stairs (General Circulation)**
Location: **Ground Floor; Upper Floors**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Polished Concrete  	5- 7 steps process. Employer/ TESDA to approved final color, size of aggreggates. Check final floor elevation. Avoid topping less than standard height (50mm or above); Satin Finish / Sheen, Non Slip
Ceiling	Exposed Structural members and utilties with drop ceiling made of acoustic panels & 12mm thk.gypsum board (white)  	White color for all utitlities. Provide proper tagging / marking for utilities (ex. Fire protection).
Walls	Light-colored limewash and combination of white  	Use of pre-fabricated or modular walls/blocks. Combination of limewash and wall paint (acrylic solvent-based coating). Accent walls should be combination of colors blue and wood veneers.
Lighting	-Fixture type -Color temperature(Kelvins) *cool/natural white: 4000-4500K *warm white for accent lighting (if applicable): 3000-3500K LED lighting,(Power-saving) Combination of drop light and recessed	Employer/ TESDA to approve design and colors of casing
Curtain Walls, Windows and Glass	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. Powder-coated aluminum framing; Employer-approved color / shade. For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction. 	Contractor to submit shop drawings and samples for approval of employer / TESDA
Handrails	Wood (preferred to be locally sourced) with stain/color on steel framing/accessories	Employer/ TESDA to approve design and colors of casing

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Multi-Disciplinary Fabrication Area; Workshop Area;**
Location: **Mostly for Ground Floor**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Epoxy Flooring (2-coat, heavy traffic, heavy duty)  	Excellent Chemical Resistant.,Self Leveling, Anti-slip, Antiskid, Antistatic, Fire Resistant, Oil, Stain & water resistant, Require little or no major maintenance). Heavy Loading Requirement for Equipment
Ceiling	Exposed structural members and utilties with drop ceiling made of acoustic panels, gypsum board (white) flat latex paint finish  	White color for all utitlities. Provide proper tagging / marking for utilities (ex. Fire protection). Acoustic Ceilign Clouds colors will be subject for approval of employer/TESDA. Preferably shades of blue
Walls	Light-colored limewash and combination of white  	Use of pre-fabricated or modular walls/blocks. Combination of limewash and wall paint . Paint finishes: Use low VOC, semi-gloss or satin sheen latex/water-based paint finish. Minimum of 2 coats of paint color. Apply proper surface preparation and primer prior to application of paint color.
Lighting	1500-2000 Lux LED lighting,(Power-saving) Combination of drop light, recessed and task lighting	Employer/ TESDA to approve design and colors of casing. -Fixture type -Color temperature(Kelvins) *cool/natural white: 4000-4500K *warm white for accent lighting (if applicable): 3000-3500K
Curtain Walls, Windows and Glass Doors	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. Powder-coated aluminum framing; Employer-approved color / shade. For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction   	Contractor to submit shop drawings and samples for approval of employer / TESDA
Window Treamtent (Roller Blinds)	Single-colored (cream or light gray), PVC sunscreen-type roller blinds with 5% openness factor	Employer/ TESDA to approved-color

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Co-Working Spaces, Showcase Area, Cafe, Pantry (Open Plan)**
Location: **Upper Floors**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Polished Concrete  	5- 7 steps process. Employer/ TESDA to approved final color, size of aggreggates. Check final floor elevation. Avoid topping less than standard height (50mm or above); Satin Finish / Sheen, Non Slip
Ceiling	Exposed Structural members and utilties with drop ceiling (cloud ceiling) made of acoustic panels, gypsum board (white) 	White color for all utitlities. Provide proper tagging / marking for utilities (ex. Fire protection).
Walls	Light-colored limewash and combination of white  	Use of pre-fabricated or modular walls/blocks. Combination of limewash and wall paint (acrylic solvent-based coating), **For Accent Walls (Veneer):** Use skin-type 0.5-0.6mm thickness veneer sheet. On concrete and on drywall applications: provide 1/2" thk plywood substrate. Ensure substrate is smoothened and free from dust and moisture prior to application. Adhesive must be polyvinyl acetate(PVA) glue or contact cement, or as per manufacturer/supplier's standard. Apply sheets with wood grains oriented vertically and in
Lighting	500-1000 Lux LED lighting,(Power-saving) Combination of drop light and recessed	Employer/ TESDA to approve design and colors of casing. -Fixture type -Color temperature(Kelvins) *cool/natural white: 4000-4500K *warm white for accent lighting (if applicable):
Curtain Walls, Windows and Glass Doors	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. Powder-coated aluminum framing; Employer-approved color / shade. For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction. 	Contractor to submit shop drawings and samples for approval of employer / TESDA
Window Treamtent (Roller Blinds)	Single-colored (cream or light gray), PVC sunscreen-type roller blinds with 5% openness factor	Employer/ TESDA to approved-color

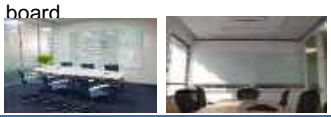
Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Meeting Room / Conference Room**
Location: **Upper Floor**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Carpet Tiles 	At least 6mm thick, 50x50cm or 60x60cm (preferred); Employer/TESDA-approved colors and pattern. Preferably Blue and Gray combination
Ceiling	Acoustic Ceiling Panels / Tiles 	NRC - 1.00; Concelaed Edges/Runners; White, 60cm x 60cm or 120cm x 60cm
Walls	Tempered Glass Walls and Doors. 	12mm thick Clear Tempered Glass Walls with frosting decal.; Walls (Masonry) Pre-fabricated; Pre-Cast Wall with acoustic and insulation partitions between other rooms; One side should be installed with smart TV and finished with accent wall (colored or wood veneer). Veneer accent wall: Use skin-type 0.5-0.6mm thickness veneer sheet. On concrete and on drywall applications: provide 1/2" thk plywood substrate. Ensure substrate is smoothened and free from dust and moisture prior to application. Adhesive must be polyvinyl acetate(PVA) glue or contact cement, or as per
Lighting	400-750 Lux LED lighting,(Power-saving) Combination of drop light, recessed and task lighting	Employer/ TESDA to approve design and colors of casing. -Fixture type -Color temperature(Kelvins) *cool/natural white: 4000-4500K *warm white for accent lighting (if applicable): 2000-2500K
Curtain Walls, Windows and Glass Doors	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. Use For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction. Powder-coated aluminum framing; Employer-approved color / shade. 	Contractor to submit shop drawings and samples for approval of employer / TESDA
Glass Writing Board	Frameless, magnetic, "write-on" and project screen glass board 	Locate on on side of meeting room/ conference area

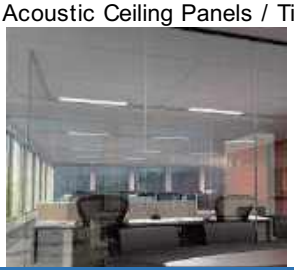
Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Incubation Rooms**
Location: **Upper Floors**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Polished Concrete  	5- 7 steps process. Employer/ TESDA to approved final color, size of aggreggates. Check final floor elevation. Avoid topping less than standard height (50mm or above); Satin Finish / Sheen, Non Slip
Ceiling	Acoustic Ceiling Panels / Tiles  	NRC - 1.00; Concelaed Edges/Runners; White, 60cm x 60cm or 120cm x 60cm
Walls	Tempered Glass Walls and Doors and Operable wall  	1.Fronting Co-Working Space: Tempered Glass Walls with Frosting Decal (Cuts and Design for approval) 2. Between rooms: Movable or Operable Partition with Acoustic properties
Lighting	400-750 Lux LED lighting,(Power-saving) Recessed Lighting	Employer/ TESDA to approve design and colors of casing
Curtain Walls, Windows and Glass Doors	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. l For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction. Powder-coated aluminum framing; Employer-approved color / shade.   	Contractor to submit shop drawings and samples for approval of employer / TESDA
Window Treamtent (Roller Blinds)	Single-colored (cream or light gray), PVC sunscreen-type roller blinds with 5% openness factor	Employer/ TESDA to approved-color

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function:	**Packaging, Processing Facility; Cold Storage Facility**
Location:	**Ground Floor**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Polyurethane Flooring  	4-component polyurethane self-levelling system. Slip-resistant mortar system; mixture of high-grade polyurethane resin base with hardener and fillers; 6mm-25mm total thickness applicationCures to a sturdy flooring system with a smooth matte-colored finish. For Cold Storage facility /storage; High-Impact, Chemical- and Water Resistant, Anti-Slip, Anti-bacterial;
Ceiling and Walls	Option 1:Insulated Metal Panels or PVC Panels   Option 2: Expanded polystyrene (EPS) wall panels Lightweight, non-load bearing precast wall panel; Compressive strength of 400-700 PSI; with fireproof rating of 4hrs against 1000 deg. C; 100-150mm thickness; water and moisture resistant; Painting- Water based paint (acrylic or latex); non-solvent type; apply as per EPS wall manufacturer's standard	Contractor to submit samples for approval of employer / TESDA. Food Grade, Moisture Resistant. Anti-Bacterial
Lighting	500-1000 Lux LED lighting,(Power-saving) Combination of drop light, recessed and task lighting	Employer/ TESDA to approve design and colors of casing. -Fixture type -Color temperature(Kelvins) *cool/natural white: 4000-4500K *warm white for accent lighting (if applicable): 2000-2500K
Doors and Windows	Steel/ Aluminum (Food Grade); Air Seal, View Panel, Self and Quick Closing, PWD-Friendly, Kick-Plates  	Contractor to submit shop drawings and samples for approval of employer / TESDA; RFID/ Security Access
Ventilation, Exhaust and Air-Conditioning	Verify with Standards for Cold Storage and Processing Facilities	

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Restrooms; PWD CR/ All-Gender Toilet**
Location: **All Floors**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	60x60cm Homogenous, Non-Slip Tiles 	Homogenous Rectified Non-Slip Tiles. Employer/TESDA-approved colors. 2.0mm max grouting width should and match the color of the tiles. Provide waterproofing for upper floors.
Ceiling	12mm thk. Moisture-Resistant Gypsum Boards 	Ceiling Height at Ground Floor: 2.70 meters, for Upper Floors: 2.50 meters. White Color, provide shadow gap.cornice and accent colors.
Walls	30x60cm Homogenous Tiles and Phenolic Board Partition 	Homogenous Rectified, 2.0mm max grouting width. Phenolic Board Partitions should have stainless steel hardware. Employer / TESDA to approved colors.
Lighting	100-300 Lux (Warm White); LED lighting,(Power-saving) Recessed Lighting (General), Strip Lights and Sconce at Mirror/Lavatory	Employer/ TESDA to approve design and colors of casing
Windows	Aluminum Powder Coated Frame, Awning.	Refer to Exterior/ Co-Working Area Specifications
Urinal	Water-less type / water-saving 	At least 300mm wide and the lip of the collection area shall project from the wall at least 300mm. Should not be set closer than 450mm from its center to any side wall partition. A ledge or should be installed in the cubicles for putting personal items.
Water Closet	Flush valves, single flush;water-saving 	Concealed Sensor Toilet Flush Valve with Manual Override. Preferably be wall hung, without leg support, so as to facilitate cleaning. A ledge should be installed in the cubicles for putting personal items.
Lavatory and Counters	Semi-Counter Type Lavatory on Quartz Countertop 	Hands-free / touch less faucet; Countertop color for approval of employer/TESDA
PWD-Fixtures	Refer to BP 344 standards for handrail and heights	Stainless steel
Accesssories	Hand dryer and automatic paper towel dispenser Infant changing table	

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Storage / Utilities, Fire Exit Access, Special Equipment**
Location: **All Floors**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Size / Floor Area	*Refer to schematic floor plan / tabulation*	
Flooring	Polished Concrete 	5- 7 steps process. Employer/ TESDA to approved final color, size of aggreggates. Check final floor elevation. Avoid topping less than standard height (50mm or above); Satin Finish / Sheen, Non Slip
Ceiling	Exposed Structural members and utilties. Soffit Painted White 	Provide proper tagging / marking for utilities (ex. Fire protection).
Walls	White, Semi Gloss Latex 	Use of pre-fabricated or modular walls/blocks. Semi Gloss Latex (White)
Lighting	500-1000 Lux LED lighting,(Power-saving) Combination of drop light and recessed	Employer/ TESDA to approve design and colors of casing. -Fixture type -Color temperature(Kelvins) *cool/natural white: 4000-4500K *warm white for accent lighting (if
Large Ceiling Fans	Industrial Ceiling Fans 	**For Workshop Areas and Optional for Co-Working Spaces / Events Space**
Gondola Lift	Provide suspended lift at roof decks for gondola access 	**For maintenance and transport of materials**

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX C

GENERAL MATERIAL SPECIFICATIONS

INTERIOR FINISHES STANDARD/ MINIMUM REQUIREMENTS

Space / Function: **Doors, Windows and Railings**
Location: **All Floors**

PARAMETER	REQUIREMENTS / PREFERRED	REMARKS
Curtain Walls, Windows and Glass Doors	As per manufacturer/suppliers' recommended specifications given the height Use of 12mm thk. Clear, Tempered Glass for glass doors. Powder-coated aluminum framing; Employer-approved color / shade. For areas facing South and West, apply Clear Glass Coating with 0.61 Solar Heat Gain Coefficient and an 86% Ultraviolet (UV) Deflection. 76% visible light transmitssion and 47% glare reduction. 	Contractor to submit shop drawings and samples for approval of employer / TESDA
Doors (Glass) Room locations: Meeting Rooms, Mezzanine Floors, Incubation Rooms.	12mm thk. Tempered Glass, Frameless Panel with glass frosting 	At least 2.4 meters in high. 0.80m wide for single door, 1.60m wide for double doors. Complete with hardware, locskets and accessories. Ready to received RFID/Security Access. Whole door/s can be framed with Aluminum (Powder Coated) but panels should be frameless. Install decorative frosting (typogrpahy/room labels). Contractor to submit samples and shop drawings
Doors (Steel) Room locations: Workshop Areas, Maker Space, Co-Working Spaces, Fire Exits	Double Leaf Swing Door, Double Action 	At least 2.40meters high and 1.50m width (Clear Opening; Fire Rated. View Glass panel should be made of tempered glass. With Aluminum Kickplates, Complete with hardware and accessories. Owner Approved Color/s. Fire Exit Signs (illuminated)
Doors (Steel) Single Door Fire Exits		Fire Rated. View Glass panel should be made of tempered glass. With Aluminum Kickplates, Complete with hardware and accessories. Fire Exit Signs (illuminated)
Roller Shutter	For Workshop Area. Automatic/Remote Controlled with Manual Override. At least 6.0 meters wide and 4.50m high 	
Restroom Doors	Self-closing. Solid Wood, with heavy duty, aluminum t 	With labels and typography. Self-closing. At least 2.4m high. Finsih can be stained or high pressure laminate with aluminum kick-plates.
Railings	Combination of Steel and Glass (Clear,Tempered) Railings 	Preferably Black or Gray

Contractor to submit samples and shop drawings for approval

Section 6 - ANNEX D

Conceptual Floor Plans

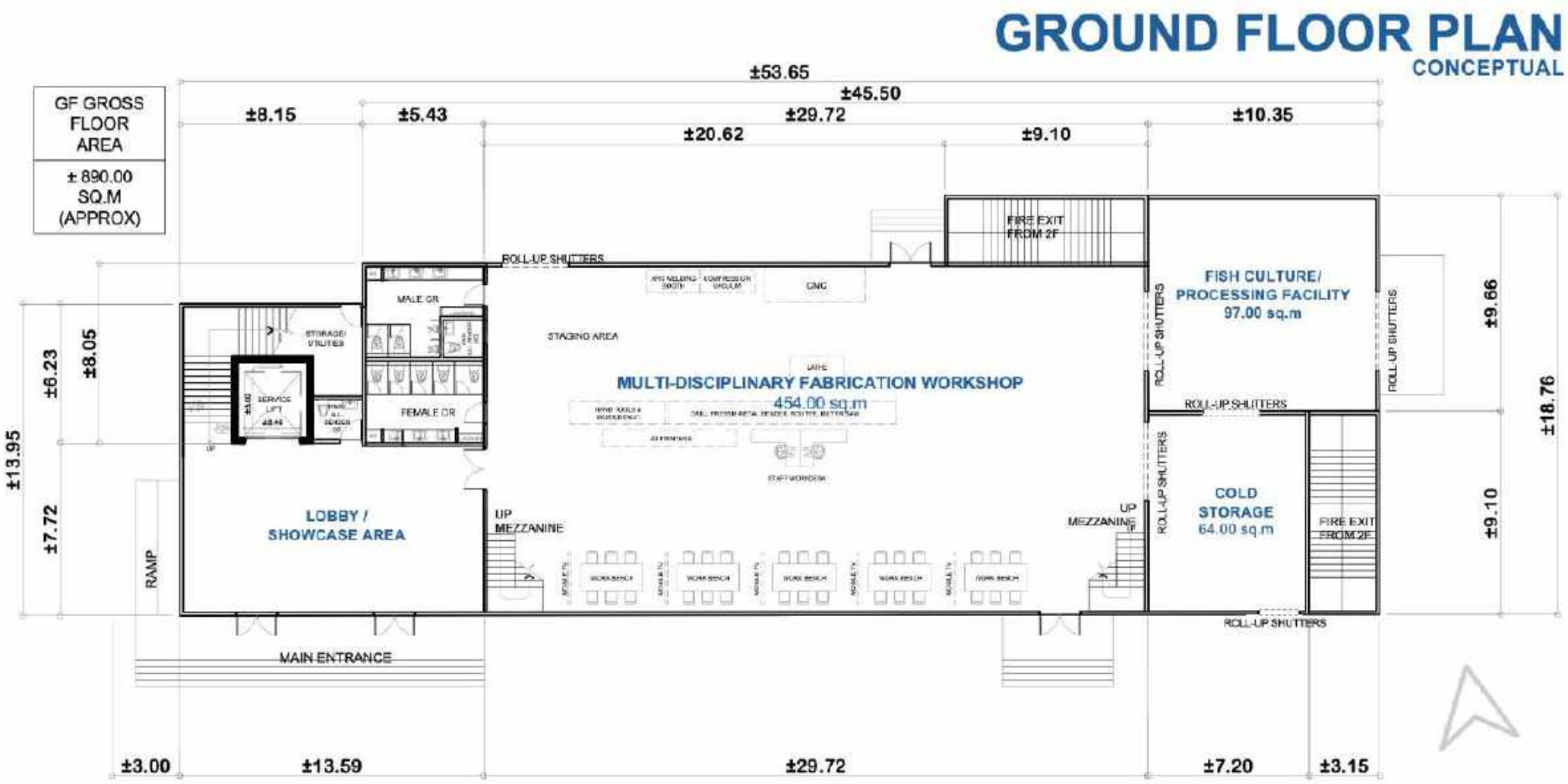
Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

LOT PLAN BASED SOLELY ON-SITE MEASUREMENTS ONLY

Section 6 - ANNEX D

Conceptual Floor Plans

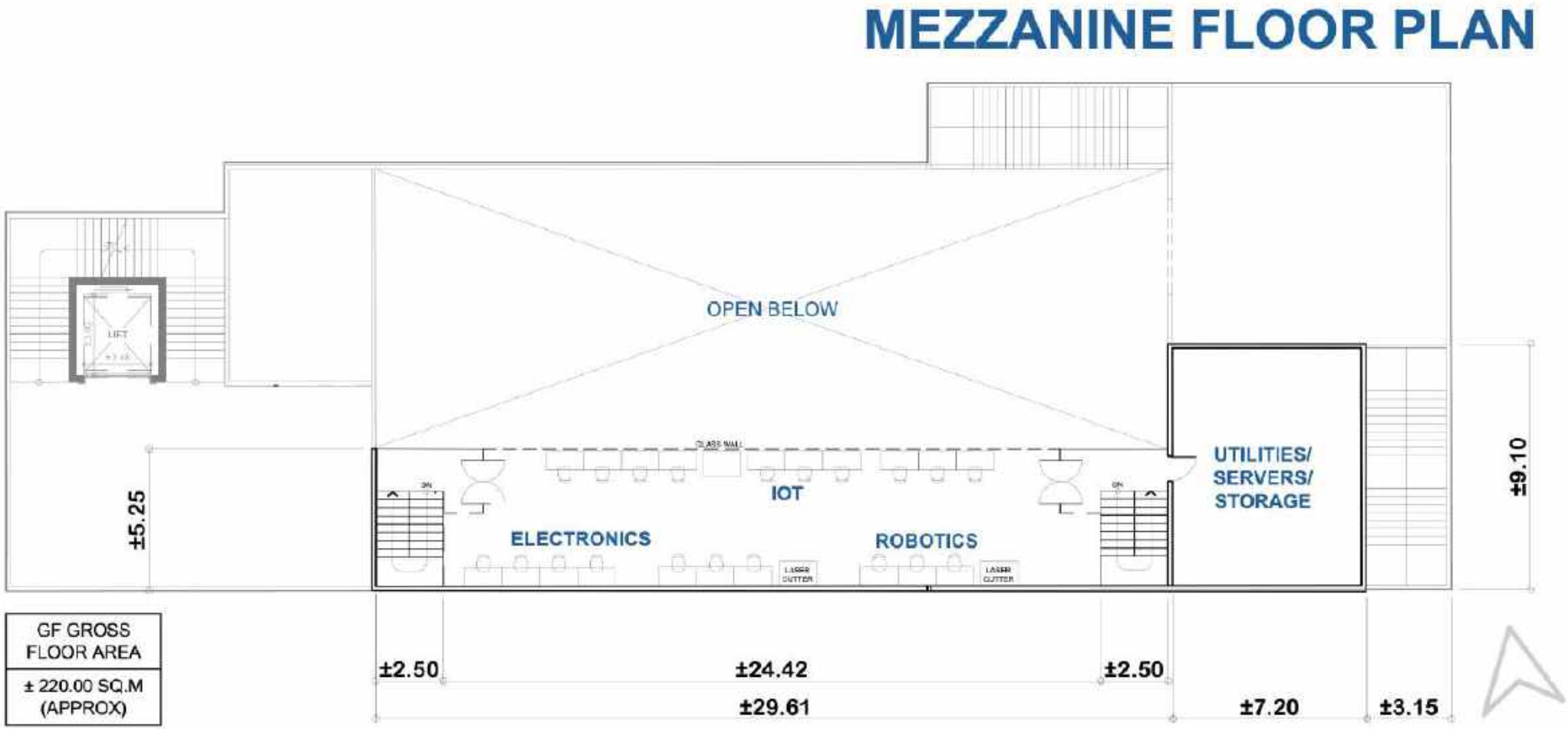
Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga



Section 6 - ANNEX D

Conceptual Floor Plans

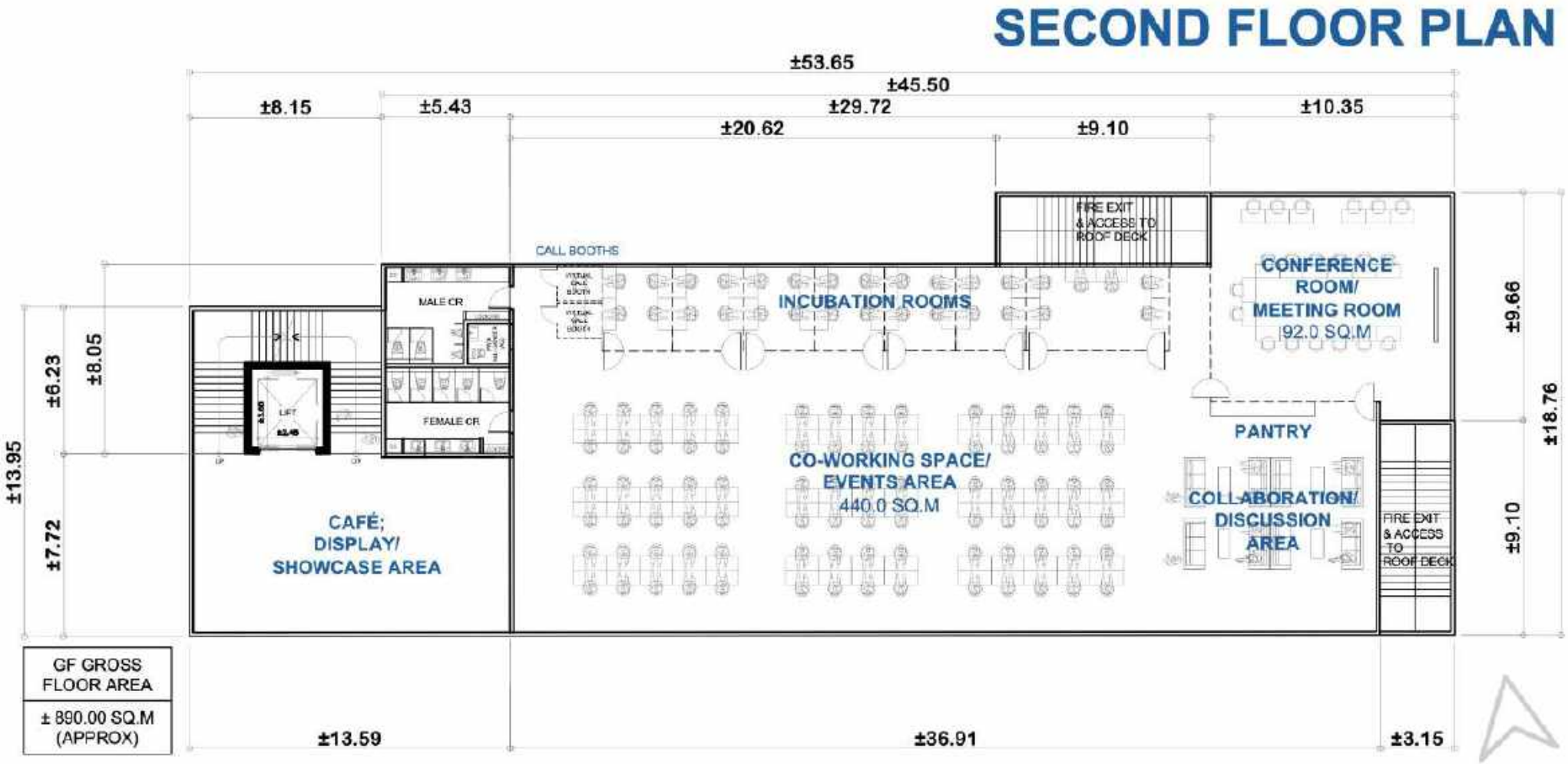
Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga



Section 6 - ANNEX D

Conceptual Floor Plans

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga



Section 6 - ANNEX D

Conceptual Floor Plans

Design and Build of the TESDA Innovation Center with Rehabilitation Works, Agusan Del Norte, Caraga

The contractor's designer may propose improvements, enhancements, and alternative solutions to meet the space requirements. The contractor may revise and enhance the initial conceptual plans with written approval from the employer and its representatives. These revisions should ensure compliance with building codes and regulations based on actual or updated site investigation reports (such as surveys and soil tests). Revisions must adhere to the approved project budget, with no additional costs or variation orders.

The Conceptual Plans and initial material specifications serve as a guide and basis that the Contractor must fully comply with under the Contract Documents, Standard Building Codes/Laws, Ordinances, and other provisions.

The Design and Build Contractor is responsible for executing all work items specified in the approved proposal, specifications, and plans. This includes providing all equipment, labor, machinery, materials, tools, supplies, transportation, and incidental expenses required to complete the project in compliance with codes, obtain necessary permits, and prepare the site, ready for use by the employer and tenants.

The conceptual plans and drawings on this bid document and appendices (Appendix B & C) are not expected to detail every aspect. Any necessary items, whether mentioned in the Specifications or shown in the Plans, must be furnished and installed as needed to complete the system, without additional charges to the employer, following industry best practices and manufacturer's installation specifications.

Before proceeding with schematic and detailed Architectural and Engineering design, the contractor must arrange a comprehensive meeting involving the employer, its representatives, or consultants. This meeting aims to clarify and agree upon design requirements and methodologies, taking into account the contract timeline and coordination with other services and Architectural and Engineering designs.

The contractor is responsible for delivering a comprehensive design that is ready for use and occupancy, adhering to the latest Philippine Codes and Laws. The initial conceptual plans and site survey on this bid document and appendices are intended as preliminary guides and must be supplemented by further site verification and detailed investigations.

All contractors submitting proposals for this project must first conduct a thorough site examination. They are required to verify and investigate existing conditions affecting the work and present proposed solutions to the employer for approval at least one week before the construction schedule begins.

The employer will not entertain claims for extra compensation resulting from the contractor's negligence or oversight in gathering necessary data from the site or architect to supplement the provided drawings.

Contractors must carry out site inspections to confirm existing site conditions, environmental factors, site surveys, geotechnical data, and other pertinent project information essential for precise design and detailed planning.

A Certification of Inspection, duly signed by the employer, must be submitted by the contractor.

The architectural design process must be based on the basic requirements provided by the procuring unit and the information obtained from site surveys and investigations. Compliance with local government regulations, as well as TESDA Industry requirements, is mandatory during project implementation.
Finally, the contractor is expected to perform detailed architectural and engineering design within the government cost range and meet the established preliminary design requirements.

Annex E : RTIC Showcase / Equipment

RTIC-CARAGA (NMSF)

Fish Culture with SMART Facility and Fish Processing Facility

Conceptual Image for Reference Only

Focal Area Showcase Components and Innovation Makerspace Specifications

General Equipment Components @ RTIC CARAGA (NMSF)

The proposed items in this annex serve only as a **general guide and overview** to the expected equipment, functions, and spatial complexity. This aims to ensure **preparedness for power requirements, anticipating higher and applicable load demands, and strategically placing utility tapping points within the new innovation center**.

The Design and Build Contractor is expected to engage in detailed discussions with TESDA, its consultants, and representatives to finalize and refine the equipment list and determine the applicable power requirements for each area.

Before proceeding with schematic and detailed Architectural and Engineering design, the design-build contractor must arrange a comprehensive meeting with TESDA, its representatives, and consultants to clarify and agree upon the design, utility, power requirements and methodologies. This ensures alignment with the contract timeline and proper coordination with other services, as well as Architectural and Engineering disciplines.

This list shall **align with other annexes and sections**, and any equipment mentioned or included in other sections/annexes but not explicitly listed here is assumed to be part of the final design and considerations to ensure a **complete, functional, and code-compliant system**. This includes, but is not limited to, elevators/lifts, HVAC systems, ventilation, fans and exhausts, fire suppression systems, internet/data/Wi-Fi, public address, alarm system security, required RFIDs and other essential equipment required for the facility's operation in other areas. (i.e *Roof Deck, Common Areas)*

TESDA RTIC

CARAGA

Recommended Equipment

For Fish Processing

(Including HACCP recommendations)

*This facility will process **Bangus (Milkfish), Tilapia (Sunfish), and Tamban (Sardine/Herring)** for **fresh, value-added, and specialty products** (e.g., deboned fish, marinated fish, fish sausage, etc.)*

1. Receiving & Inspection

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Receiving Table (Stainless Steel)	Initial sorting and visual inspection of incoming fish	1–2 tables	Easy to clean; ensure sufficient lighting for quality checks
Bench/Floor Weighing Scale	Weighing fish batches on arrival	1 primary + 1 backup	Waterproof, regularly calibrated; keep calibration records
Food-Grade Totes/Bins	Short-term holding/transport from receiving to chilled storage	10–15 bins	Color-code to avoid cross-contamination between raw and partially processed fish
Ice Maker & Ice Bin	Produces flake or crushed ice for immediate cooling	1 machine + 1 storage bin	Match capacity to peak intake; routine cleaning to prevent biofilm formation
Hand Wash Station (Receiving Area)	Ensures hand hygiene before fish handling	1 station	Foot-pedal or sensor faucet; liquid soap & single-use towels; signposted for HACCP
Consumables: Gloves, Hairnets, Aprons, Single-use Towels, Ice (ongoing)	Personal protection, chilling fish	Stocked per daily usage	Replace/dispose frequently; store extra consumables in a clean, dry area

1. Receiving & Inspection

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Receiving Table (Stainless Steel)	Initial sorting and visual inspection of incoming fish	1–2 tables	Easy to clean; ensure sufficient lighting for quality checks
Bench/Floor Weighing Scale	Weighing fish batches on arrival	1 primary + 1 backup	Waterproof, regularly calibrated; keep calibration records
Food-Grade Totes/Bins	Short-term holding/transport from receiving to chilled storage	10–15 bins	Color-code to avoid cross-contamination between raw and partially processed fish
Ice Maker & Ice Bin	Produces flake or crushed ice for immediate cooling	1 machine + 1 storage bin	Match capacity to peak intake; routine cleaning to prevent biofilm formation
Hand Wash Station (Receiving Area)	Ensures hand hygiene before fish handling	1 station	Foot-pedal or sensor faucet; liquid soap & single-use towels; signposted for HACCP
Consumables: Gloves, Hairnets, Aprons, Single-use Towels, Ice (ongoing)	Personal protection, chilling fish	Stocked per daily usage	Replace/dispose frequently; store extra consumables in a clean, dry area

2. Pre-Processing (Fish Culture/Processing Facility Floor)

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Washing Troughs / Rinsing Tanks (Stainless)	Rinsing and cleaning raw fish prior to trimming/gutting	1–2	Continuous water flow; good drainage; frequent sanitization
Work Tables (Stainless, with Drainage)	Manual gutting, trimming, deboning, portioning	2–3	Separate raw prep vs. partial/clean prep areas; easy to sanitize
Cutting Tools (Knives, Filleting Blades)	Manual processing of fish (deboning bangus, filleting tilapia, etc.)	Sufficient sets per shift	Color-coded boards and utensils to prevent cross-contamination; routine sharpening/sterilization
Waste Bins (covered, color-coded)	Collection of fish offal, general waste	2–3 bins	Keep covered to deter pests; empty frequently; separate fish waste from packaging waste
Hand Wash Station (Inside Processing)	Reinforces hygiene after handling raw product	1–2 stations	Clearly marked, foot/sensor-operated faucet; signposted as mandatory before returning to work areas
Consumables: Disposable Gloves, Knife Sanitizing Wipes, Plastic Liners, Cleaning Cloths	Safe handling & quick cleaning	Stock as needed	Implement a rotation system to ensure cleanliness; store consumables away from raw materials

3. Cold Storage

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Walk-In Chiller (~0–4 °C)	Short-term holding of fresh fish before/after processing	1	Monitor daily temperature logs; maintain clear signage to separate raw vs. packaged goods
Holding Freezer (~–18 °C)	Long-term storage of frozen fish/finished products	1	Use an alarm or data logger for continuous temperature monitoring; keep records of any deviations
Racks / Shelving Units (Cold-rated)	Organized storage off the floor	4–6 racks (depending on layout)	Stainless or powder-coated steel for easy cleaning; ensure adequate space for airflow
Temperature Monitoring System (Data Logger)	Track and record temperatures	Sensors for each cold zone	Calibrate regularly; set alarms for out-of-range conditions; maintain written/electronic logs
Consumables: Freezer-grade Labels, Pallet Liners/Covers, Thermometer Probes, Sanitizing Sprays	Product identification, temperature checks	Ongoing stock	Use moisture-resistant labeling; keep probe wipes for hygienic temp checks; store chemicals safely

4. Value-Added & Specialty Products (Processing Area)

(These items may share space with the main “Fish Culture/Processing Facility,” but a dedicated corner or zone is recommended to avoid cross-contamination.)

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Marination / Breading Station	Adding seasoning, brines, or coatings to fish fillets or deboned fish	1–2 prep tables/tubs	Clearly label marinade batches; track marinade contact times and temps
Vacuum Packaging Machine	Removing air for extended shelf life (chilled or frozen) products	1–2 machines (smaller scale)	Validate seal integrity; frequent cleaning/sanitizing of sealing chamber
Heat Sealer (Band or Impulse type)	Sealing plastic pouches (if not vacuum packaging)	1	Verify correct seal temperature/time; check seal integrity (no leaks)
Mixer or Blender (Optional)	Preparing fish-based specialty products (e.g., fish sausage or fish patties)	1	Clean thoroughly after each batch; watch for allergen cross-contamination if using other ingredients
Label Printer / Barcode Printer	Printing product labels (batch codes, expiry dates, nutritional info)	1	Essential for traceability; incorporate best-by or freeze-by dates
Consumables: Vacuum Pouches, Packaging Films, Seasonings, Sauces, Labels/Stickers	Specialized ingredients & packaging for value-added products	Keep adequate stock	Store away from raw fish to avoid contamination; track lot numbers for traceability

5. Metrology / QC Room

(Upper Floor: 7.2 m × 4.5 m)

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Precision Weighing Scale	Checking portions, testing product formulations	1	Calibrate regularly; stable environment away from production dust
pH Meter	Monitoring pH of brines, marinades, finished items	1–2	Daily calibration with buffer solutions; sanitize probes; keep usage logs
Thermometers (Probe/Infrared)	Spot-checking fish/product temperatures	2–3 sets	Keep calibration certificates; sanitize probes between uses
Water Activity Meter (Optional)	Testing a_w in dried/semi-dried/specialty products	1 (if producing shelf-stable)	Critical for shelf-life determination; ensure operator training
Mini Fridge/Freezer (QC Samples)	Storing reference/retention samples for analysis	1 small fridge/freezer	Label samples clearly; separate from production stocks
Consumables: Calibration Buffers, Microbiological Swabs, Petri Dishes, Lab Notebooks	Support QC testing & record-keeping	Stock as needed	Maintain MSDS/SDS for any lab chemicals; keep locked or controlled to avoid contamination

6. Cleaning & Sanitation

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Hand Wash Sinks	Reinforce employee hygiene in processing/packaging areas	1–2 (plus receiving)	Foot- or sensor-operated faucets; liquid soap & disposable towels; keep signage for mandatory use
Three-Compartment Sink (if space)	Wash, rinse, and sanitize small equipment & utensils	1	Monitor wash/rinse water temperature and sanitizer concentration
High-Pressure Wash-Down Hose	Cleaning floors, large equipment surfaces	1	Ensure adequate floor drainage; isolate raw/final product zones to avoid cross-contamination
Lockable Chemical Storage Cabinet	Secure storage of cleaning chemicals, PPE	1	Keep away from raw materials and packaging; label all chemical containers
Foot Bath / Sanitizing Mats	Disinfect footwear entering high-risk areas	2–3 mats at key doors	Regularly change sanitizing solution; part of standard sanitation operating procedures (SSOPs)
Consumables: Detergents, Sanitizers, Disinfectant Wipes, Disposable Gloves, Floor Squeegees	Supports daily and deep cleaning	Stock as needed	Follow proper chemical handling protocols; track usage and inventory

7. Utilities & Support

Equipment	Purpose/Use	Recommended Qty	Key HACCP Considerations
Backup Generator	Power for critical equipment (chillers, freezers) in outages	1 (sized for essential loads)	Routine maintenance/testing; automatic transfer switch recommended
Pallet Jacks / Hand Trolleys	Moving raw materials, finished goods, and supplies	1–2	Clean wheels to avoid cross-contamination; separate paths for raw vs. packaged
Air Compressor (if needed)	Running pneumatic tools or packaging lines	1 (food-grade)	Oil-free lines; filter to prevent contamination
Waste Disposal Bins	Segregation of fish offal, general waste, recyclables	3–4 bins (color-coded)	Keep covered to minimize pests/odors; empty frequently
Consumables: Personal Protective Equipment (Face Masks, Earplugs, Safety Glasses), Spare Machine Parts, Light Bulbs	Worker safety & equipment maintenance	Stock as needed	Ensure PPE distribution & proper signage; maintain an inventory of critical spare parts

8. Additional Items

- **Flooring & Drainage Solutions**
  - Provide dedicated drains with screens or grease traps for fish residues.
  - Proper floor slope and drainage for HACCP to reduce puddling and microbial harborage.
- **Waste Management**
  - Provide for disposal of large volumes of fish offal and/or wastewater are disposed of (e.g. specialized disposal system, or a composting station if environment regulations are strict).
- **Ice Storage & Handling**
  - **Ice makers**: large bin storage capacities (especially if throughput is high). If fish volumes are large, a more robust ice handling system (auger or flake ice machine) might be needed.
- **Maintenance Workshop or Spare Parts Storage**
  - **Maintenance area** or basic workshop (with secure tools) for critical quick repairs can be done at the heavy equipment area.
- **Pest Control**
  - Provide items like **pest traps**, **UV insect lights**, or **air curtains** at loading docks highly recommended.
- **IT / Software for Inventory & Traceability**
  - Modern facilities with **digital inventory management system** or ERP solution (especially for multi-product lines). If volume scales up required, this may be beneficial (have RTIC make the assessment of required scale)

SECTION 6 -ANNEX G

Initial
Environmental Examination
(2021)

Philippines: Supporting Innovation in the Philippine Technical and Vocational Education and Training System Project

Prepared by Technical Education and Skills Development Authority, Government of the Philippines for the Asian Development Bank.

EXECUTIVE SUMMARY

Introduction

The Philippine Government has requested a loan from Asian Development Bank (ADB) in the amount of $ 100 million to finance the proposed Supporting Innovation in the Philippine Technical and Vocational Education and Training Project (the Project) which will support the Philippine Development Plan (2017–2022) to improve the quality of technical and vocational education and training (TVET) training programs, integrate 21st century competencies, strengthen certification, encourage research and innovation, and forge stronger links between TVET institutes and industry to increase employability of Filipino youth. The Project aims to strengthen the global competitiveness and readiness of Filipino mid-level workforce and to effectively use TVET as an instrument for social equity for workforce inclusion and poverty reduction. The Executing Agency is the Technical Education and Skills Development Authority (TESDA).

Project Rationale

This Initial Environmental Examination (IEE) was prepared in relation to the upgrading and modernization of 17 TESDA technology institutions (TTIs), one per region, into industry-responsive innovation centers. To support the implementation of innovations within TESDA, Regional TVET Innovation Centers (RTICs) will be established in 16 regions and TTI facilities will be rehabilitated in 17 regions. Except for RTIC-Cebu, which has its own innovation center already,new RTICs will also be established within 16 TTIs. Each innovation center will have different areasof specialization supportive to the region's economic drivers.

Each innovation center will provide the infrastructure to operationalize the strategy for social innovation and the processing of "shared context" for quality assurance, upskilling of workforce, entrepreneurship, applied research and development, problem-solving to create social value, collaborative arrangements and institutional partnerships (international and domestic). It will serve as information hub and connector between the local industry and the government agencies (national and local), firms (domestic and international), training institutions, colleges, universities and research institutions.

Aside from the physical facility, the TTIs with RTICs will also be capacitated to include in their current curricular offering higher-level TVET programs (Philippine Qualifications Framework levels III to V) and joint skills development programs with industry, focusing on 21st century skills and new, advanced and emerging technologies. Complementary to the skills development programs of the TTIs, the RTICs will offer research, innovation, entrepreneurship and startup training programs. Likewise, the RTICs will be capacitated to implement "spoke and hub model" and provide technology demonstration services, research and development services, and incubation and business start-up services to its learners, industry partners and public and private technical vocational Institutions (TVIs) within the region.

The Project will support 4 outputs:

- Output 1: The Philippines's skills development ecosystem modernized
- Output 2: TVET training made more demand-driven and industry-led
- Output 3: Selected TESDA TTIs upgraded and modernized into industry-responsive innovation centers
- Output 4: TESDA's management capacity and resilience strengthened.

Purpose and Methodology of Environmental Assessment

This environmental assessment focuses on the upgrading and modernization of TTIs into industry-responsive innovation centers. These TTIs will have improved training facilities and equipment that will benefit students. Climate-smart designs and climate-proofing measures will be adopted while upgrading the TTIs and establishing select RTICs.

Environment Classification and Assessments

The Project is classified as environment category B based on ADB's Rapid Environment Assessment (REA) Checklist and Safeguards Policy Statement (SPS) 2009, requiring the preparation of an IEE and Environmental Management Plan (EMP). The IEE and EMP covers the civil works proposed under Output 3 of the Project, which covers the rehabilitation of existing TTIs and construction of new RTICs. The proposed civil works will be undertaken entirely within the existing campuses of TESDA, which are all owned by TESDA and / or the government of the Philippines. The proposed sites are located within built-up areas. There are no protected areas, wetlands, mangroves, estuaries, cultural heritage site or historical monuments that will be directly affected by the Project.

For new project where the total construction area is less than 1 hectare, it is not covered by the Philippine Environmental Impact Statement System (PEISS), based on the Department of Environment and Natural Resources–Environmental Management Bureau's (DENR-EMB) Memorandum Circular (MC) 005, series of 2014. The expansion, modification and/or rehabilitation of existing buildings with issued environmental compliance certificate (ECC), on the other hand, requires amending the ECC through the submission of an Environmental Performance Report and Management Plan to the DENR–EMB regional office where the project is located. A Building Permit must be secured from the local government unit where the facility will be constructed, in compliance with Presidential Decree No. 1096 (National Building Code of the Philippines) before any type of building construction or repair work can start. No significant non-compliance of existing facilities with government environment requirements has been observed during various consultations with TTIs, and basic environmental and utility services (water supply, wastewater treatment, and drainage) will be improved as part of upgrading of TTI facilities. The project will ensure that all the requisite clearances and permits will be secured prior to construction.

The detailed design of the TTIs and RTICs will conform with the National Building Code of the Philippines and international standards. Applicable local government clearances such as building, sanitary and electrical permits will be secured prior to construction. Other permits to be secured include Fire Safety Evaluation Clearance, Height Clearance Permit (for sites near airports) and Tree Cutting Permit. This IEE will be updated to include the detailed design of the Project.

Environmental Conditions at Project Sites

All of the identified TTIs have sufficient land for the proposed rehabilitation of existing buildings and construction of new buildings. All of the identified TTIs are connected with existing national, provincial, or local roads and can be accessed through public transportation. All TTIs have available land for the proposed innovation centers. The proof of occupancy includes Usufruct, Presidential Proclamation and Republic Act, Deed of Donations, Tax Declaration and Land Title.

In terms of topography, only the Regional Training Center - Baguio is located upland, with an elevation of 1,338 meters above sea level (masl), while the other 16 TTIs are located lowland, with an elevation that ranges from 3 to 43 masl.

The provinces that are at most risk to earthquakes include Benguet, Pangasinan, Davao Oriental, Leyte, Agusan del Norte and South Cotabato. Pangasinan is prone to earthquake, specifically the deep-focused ones, because of the Manila Trench, while Davao Oriental, Leyte, Agusan del Norte and General Santos have earthquake hazards due to the Philippine Fault Zone. Frequency of shallow and left-lateral strike-slip earthquakes in Eastern Pangasinan and Benguet can be attributed to its location along the Philippine Fault Zone. Benguet, Oriental Mindoro, Davao Oriental, South Cotabato and Misamis Oriental are susceptible to landslide hazards.

In terms of tsunami hazard, the TTIs that are most at risk from tsunami include Pangasinan Technological Institute, Regional Training Center Cavite, Laguna, Rizal, Quezon (RTC CALABARZON), Provincial Training Center Oriental (PTC) Mindoro – San Teodoro, RTC Iloilo, RTC Cebu, and RTC Zamboanga Peninsula (high potential); RTC Tacloban, RTC Tagoloan, and Davao Oriental Polytechnic Institute (local generators); and General Santos National School of Arts and Trades (local and foreign generators).

Active volcanoes that are within 100 km from proposed TTIs include Mt. Pinatubo, which is 65.13km from RTC Central Luzon- Guiguinto; Taal Volcano, which is 55.34 km and 29.06 km from RTC NCR and RTC CALABARZON, respectively; Mt. Isarog and Mt. Iriga, which is 13.86 km and 24.87 km, respectively, from RTC Pili; Davao Oriental Polytechnic Institute, which is 52 km from Leonard Range Volcano (or Leonard Kniazeff); and Mt. Parker, which is 30.72 km from General Santos National School of Arts and Trade.

In terms of frequency of tropical cyclones (TCs), Region II was the most affected, with 81-106 TCs from 1953-2010, while Regions I, CAR, V and VII received about 61-80 TCs for the same period. Regions XI, XII and BARMM received the lowest number, with 1-2 TCs for the same period.

TTIs most at risk for flooding include Pangasinan Technological Institute, RTC Tuguegarao, RTC - NCR, RTC – Pili, RTC Zamboanga Peninsula, RTC Tagoloan, and Davao Oriental Polytechnic Institute, where flooding may reach up to 1.5 meters during a 5-year return period. RTC Central Luzon – Guiguinto is also at risk for a 1.5 m flood with a return period of 25 years. TTIs with medium to high (>0.5 m to >1.5 m) 100-year return period flood hazard, include RTC – Baguio and Regional Manpower Development Center, while TTIs with low probability or no flooding, even a 100-year return period, include RTC – CALABARZON, PTC Oriental Mindoro – San Teodoro, RTC – Iloilo, RTC – Cebu, RTC – Tacloban, General Santos National School of Arts and Trades, and Northern Mindanao School of Fisheries.

Areas highly at risk to El Niño – induced drought include Davao Oriental, South Cotabato, Sultan Kudarat, Misamis Oriental and Cebu. Provinces included in the Project that are most at risk to projected rainfall changes are Batangas, Pangasinan, Metro Manila, Bulacan, Camarines Sur, Cebu, Leyte, Misamis Oriental and Sultan Kudarat.

In terms of locations of protected areas and key biodiversity areas, RTC Baguio and Regional Manpower Development Center are 1 km within buffer zone of Lower Agno Watershed Forest Reserve and Marcos Highway Watershed Forest Reserve; and Liguasan Marsh, respectively. General Santos National School of Arts and Trades is 5 km within buffer zone of Sarangani Bay Protected Landscape; PTC Oriental Mindoro– San Teodoro, also 5 km within buffer zone of Puerto Galera; and RTC Zamboanga Peninsula, also 5 km within buffer zone from Pasonanca watershed.

RTC Tuguegarao, RTC Pili, RTC Cebu and RTC Tacloban, are all10 km within buffer zone of nearest protected areas.

Environmental Impacts and Mitigation Measures

A comprehensive environment and social safeguards questionnaire was prepared and used during the site surveys of TTIs. Assessments were done through video conferencing with TESDA regional safeguards focals to verify the initial assessments identified in the environment and social safeguards questionnaires sent to regional offices in November 2020. The National Institute for Technical Education and Skills Development (NITESD)-TESDA central office assisted in completing the questionnaires and provided lacking information.

The project is expected to have positive impact on the quality of (TVET in the Philippines. Students who intend to pursue TVET will directly benefit from upgraded curriculum geared towards the fourth industrial revolution (4IR), and better facilities in innovation centers.

During the pre-construction phase, major risks and potential negative impacts include geological and natural hazards, flooding risks and climate change impacts; and minor impacts on vegetation (loss of trees).

During construction, major potential impacts include disturbance of land and soil condition and generation of wastes from rehabilitated TTIs and construction of innovation centers, and impact on air quality and noise level; and medium impacts on the following: surface water quality, loss of vegetation, reduced water supply from ground water, temporary disturbance of access, increased level of use of water, increased level of vehicle traffic, and health and safety of workers and the community. There is a risk that asbestos or asbestos containing materials could be present in some of buildings to be demolished or rehabilitated. The Project will refer to DENR Administrative Order (DAO) No. 2000 – 02 (Chemical Control Order for Asbestos), particularly Section IX, Specific Requirements and Standards, item 6 – Renovation, Removal and Demolition Requirements. Based on the DAO, the duly authorized owner or operator, in this case the TTI, through the Design and Construction Supervision Consulting (DSC) Firm, shall thoroughly inspect and assess the facility to verify the presence of any friable asbestos containing materials, or non-friable asbestos containing materials that have become friable prior to the commencement of any demolition and/or rehabilitation activity. In addition, and based on the findings of the risk assessment, the DSC Firm will also develop a risk management plan to be refined and implemented by works contractors during the construction phase, using qualified and experienced experts.

During operation, major risks and impacts include climate change risks, while medium for generation of solid wastes from TVET activities, potential deterioration of water quality, additional strain to existing water resource, traffic generation, increase in level of particulate matter, and risks of students and workers from handling equipment.

Based on the assessment of adverse impacts of the Project, mitigating measures were proposed to address these potential impacts.

Information Disclosure, Consultation and Participation

Public consultations were conducted with different stakeholders via Microsoft Teams and Zoom videoconferencing due to travel restrictions brought by the COVID-19 pandemic. Concerns and recommendations of the stakeholders were incorporated in the environmental management plan

(EMP). A grievance redress mechanism (GRM) was also established at the national and regional levels to address concerns and complaints arising from the Project construction.

In line with ADB's Access to Information Policy (2018), the IEE Report for the project will be made available in a timely manner, in an accessible place, and in a form and language that will be understood by affected people and other stakeholders. The purpose is for affected people, including the general public, to provide meaningful inputs during project implementation. As this version of the IEE is based on the conceptual design, updated IEE reflecting detailed engineering design, which incorporates further inputs and feedbacks of all concerned stakeholders, will also be made available to the public.

Grievance Redress Mechanism

The Project Management Unit (PMU) will establish and maintain a grievance redress mechanism to register, assess, and address project-related complaints. The TTIs will assign GRM focals prior to commencement of works to address the issues raised by affected people on the project. Contact number of the contactor, the TTI safeguards focals, the PMU and the design andconstruction supervision consultant (DSC) including names, positions, and telephone numbers shallbe disclosed at the project site. Persons or groups with project related issues may file their complaints with the GRM focals through the grievance intake form or through email or complaints box that will be made available in each TTI. The TESDA GRM focal at the regional office will be responsible for the registration of grievances and communication with aggrieved party.

Environmental Management Plan

The EMP for the project includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates and performance indicators. The Contractor must adhere to the mitigating measures and other requirements in the EMP to ensure that construction will not adversely affect the environment, the community and workers. In addition, the Contractor will prepare the following detailed Contractor's EMP (CEMP): workers' accommodation plan, occupational health and safety plan, emergency response plan, traffic management plan, waste disposal management plan, and demobilization plan. The contractor will also implement an asbestos risk management plan, as applicable.

I. INTRODUCTION

A. Project Concept and Rationale

1. The proposed Supporting Innovation in the Philippine Technical and Vocational Education and Training System Project (the Project) aims to strengthen the institutional capacity of Technical Education and Skills Development Authority (TESDA) as a public institution with the mandate to develop strategies and regulate the technical and vocational education and training (TVET) ecosystem, as well as become key actor in enabling policy and social innovations towards inclusive sustainable development.

2. The Philippine Development Plan, 2017–2022 emphasizes the need to improve the quality of TVET training programs, integrate 21st century competencies, strengthen certification, improve research and innovation, and forge stronger links between TVET institutes and industry to increase employability of Filipino workforce, including women and the youth.

3. The National Technical Education and Skills Development Plan 2018–2022 (NTESDP) identified priority industries and employment generators of TVET subsector, namely: (i) tourism; (i) construction; (iii) information and communication technology and business process management; (iv) transport, communication and storage; (v) agriculture, fisheries, and forestry (including agro-processing); (vi) manufacturing including food manufacturing and electronics; and (vii) health, wellness, and other social services. The NTESDP 2018–2022 highlights the need to address social inequity through "greater collaboration between TESDA and other agencies that serve the basic sectors including agriculture, agrarian reform, environment and natural resources and social welfare and development. Moreover, recent social development policies likewise affirm the role of TVET and TESDA in human capital development, and convergence with other social programs such as universal access to health care, education, and social protection.

B. Methodology for Environmental Assessment

4. The project has been screened and categorized as "B" for environment since the proposed impacts of civil works are site-specific and confined within TESDA campuses, most are reversible, and can be managed using mitigation hierarchy and implementation of environmental management plan. This Initial Environmental Examination (IEE) and Environmental Management Plan (EMP) have been prepared based on ADB's Safeguard Policy Statement (SPS, 2009).

5. The preparation of this IEE and EMP was guided by the following: ADB SPS (2009), ADB Operational Manual Section OM/F1, Access to Information Policy (2018), World Bank Group Environment, Health and Safety (EHS) Guidelines, the Philippine Environmental Impact Statement System (PEISS) and relevant Philippine environmental laws and regulations.

6. This IEE presents the findings from the assessment of 17 TESDA regional training centers and schools that represent each region in the Philippines. The assessments were done in two parts: the first, conducted in the 4th quarter of 2020, used environmental and social safeguards questionnaires to get information about TESDA facilities and the baseline environmental and social conditions in each site. The second, which was done in February 2021, involved consultations online with designated safeguards focal for each region, together with staff from the NITESD-TESDA. These consultations consisted of capacity building of safeguards focals on ADB's SPS, particularly Safeguards Requirements 1: Environment; discussion on proposed Innovation Center site or alternative sites; discussion and clarification on the environmental and social safeguards questionnaires; and discussion on safeguards focals' responsibilities during

project implementation, creation of Grievance Redress Committee for each TESDA site, and safeguards focals' role in monitoring and submission of reports to TESDA Central Office and ADB.

7. Following the survey and consultations, secondary data were gathered from different sources such as TESDA technology institutions (TTIs) proximity to protected areas or areas with high biodiversity, climate change and geological hazards, and socio-economic conditions in the area, where TESDA facilities will be constructed or rehabilitated. For each phase of the project, activities were identified as well as the environmental implications of each activity. Mitigation measures were proposed to address adverse environmental impacts. Responsibilities and budget for mitigation measures, frequency and parameters for environmental monitoring and reporting, institutional arrangements, and capacity building activities, were likewise indicated in the proposed Environmental Management Plan.

II. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB's Environment Safeguard Policy

8. The environment safeguards requirements of ADB are presented in the following guidelines:

(i) Safeguard Policy Statement (SPS) (2009),
(ii) Operational Manual Section F1/BP[2], and
(iii) Access to Information Policy (2018)

9. ADB's Strategy 2030[3] emphasizes the pursuit of environmentally sustainable and inclusive economic growth for developing member countries (DMCs) and requires mitigation to address environmental and social impacts of projects. The ADB's Safeguards Policy Statement (SPS, 2009) governs the environmental and social safeguards of ADB's operations. When a project has been identified for ADB financing, it is screened and categorized to determine the following:

(i) Significance of potential impacts or risks of the project to the environment
(ii) Level of assessment and institutional resources required to address the safeguard issues; and
(iii) Information disclosure and consultation requirements.

10. The Environmental Safeguard Requirements 1 (SR1) of the SPS (2009) outlines the requirements that borrowers/clients have to meet. These requirements include assessing impacts, planning and managing impact mitigations, preparing environmental assessment reports, disclosing information and undertaking stakeholder consultations, establishing a grievance redress mechanism, and monitoring and reporting. It also includes specific environmental safeguard requirements pertaining to biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement, occupational and community health and safety, and conservation of physical cultural resources.

11. For environmental safeguards, projects are classified into the following categories:

i) **Category A**. The proposed project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented; impacts may affect an area larger than the sites or facilities subject to physical works. A full-scale environmental impact assessment (EIA) including an EMP, is required.

ii) **Category B**. The proposed project's potential environmental impacts are less adverse and fewer in number than those of category A projects; impacts are site-specific, few if any of them are irreversible, and impacts can be readily addressed through mitigation measures. An IEE, including an EMP, is required.

iii) **Category C**. The proposed project is likely to have minimal or no adverse environmental impacts. No EIA or IEE is required although environmental implications need to be reviewed.

iv) **Category FI**. The proposed project involves the investment of ADB funds to, or through, a financial intermediary.

12. Project categorization has been done using REA checklist following the guidance provided above and the project is categorized as B. As per SPS 2009, **Category B** projects warrants preparation of an IEE.

13. The SPS (2009) includes 11 policy principles on environment safeguards on screening, conduct of environmental assessment, alternative analysis, mitigation hierarchy, need for meaningful consultation, public disclosure, environmental management planning, biodiversity protection and conservation, pollution prevention, occupational health and safety, and conservation of physical cultural resources. The requirements of the 11 policy principles are detailed in Table 1.

Table 1: Environmental Safeguard Policy Principles of ADB Safeguard Policy Statement (2009)

Environment Policy Principle	Requirement
1. Screening and categorization	Use of a screening process for each proposed project to determine the extent and type of environmental assessment commensurate with the significance or potential impacts and risks.
2. Environmental assessment	Conduct of an environmental assessment for each proposed project to identify potential impacts and risks to environment and people.
3. Examination of alternatives	Examine alternatives to project's location, design, technology, and components and their potential environmental and social impacts. Also consider the "no project" alternative.
4. Environmental mitigation and monitoring plans	Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.
5. Consultation and grievance redress mechanism	Carry out meaningful consultation with affected people and facilitate their informed participation early in the project preparation process and ensure that their views and concerns are taken into account. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns regarding the project's environmental performance.
6. Public disclosure	Disclose the environmental assessment including the EMP in a form and language understandable to affected people and other stakeholders.
7. EMP implementation and monitoring	Implement the EMP and monitor its effectiveness. Document the monitoring results, including corrective actions and disclose the monitoring reports.
8. Protection of critical habitats	Do not implement project activities in areas of critical habitats unless (i) there are no measurable adverse impacts on the critical habitat, (ii) there is no reduction in the population of any recognized endangered or critically endangered species and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, additional programs to promote and enhance the conservation aims of the protected area will be implemented.

Environment Policy Principle	Requirement
9. Pollution prevention and control technologies	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank's Environmental, Health, and Safety (EHS) Guidelines.
10. Occupational health and safety	Provide workers with safe and healthy working conditions and prevent accidents, injuries and diseases in the workplace. Minimize adverse impacts and risks to the health and safety of local communities.
11. Preservation of physical cultural resources	Conserve physical cultural resources and provide a "chance find" procedure and conservation approach for materials that may be discovered during project implementation.

EHS = Environmental, Health, and Safety, EMP = environmental management plan.

14. Aside from ADB SPS (2009), the ADB also prescribes the Access to Information Policy (2018) which requires consultations, participation and disclosure of information to enhance stakeholders' trust in and ability to engage with ADB. The policy promotes transparency, accountability, and participatory development. It establishes the disclosure requirements for documents produced or to be produced through ADB assistance. The IEE, EMP and the environmental monitoring reports of the project are to be disclosed at the ADB website in accordance with the Access to Information Policy (2018).

15. For a category B project, the draft IEE report should be available to interested stakeholders before project approval and posted on the ADB's website upon Board approval of the project.

B. Philippines' Legal Framework and Regulatory Requirements

16. Presidential Decree (PD) 1151, enacted on June 6, 1977, established the Philippine Environment Policy to address the need to formulate an integrated program to protect the environment. The policy mandates the government, in cooperation of concerned private organizations and entities to use all practicable means to promote the general welfare of the people through safe, decent, helpful, productive and aesthetic environment. All agencies and instrumentalities of the national government, including all government owned and controlled corporations, as well as private companies and entities with projects or undertakings that can significantly affect the quality of the environment, are required to prepare a detailed statement on the environmental impact of the proposed action, project or undertaking.

17. Presidential Decree 1586, which became effective on June 11, 1978, established the Philippine Environmental Impact Statement System. Section 4 of the decree empowers the President or his duly authorized representative to grant or deny the issuance of environmental compliance certificates (ECCs) for environmentally critical projects (ECPs) and projects within environmentally critical areas (ECAs).

18. Presidential Proclamation No. 2146 (Proclaiming Certain Areas and Types of Projects as Environmentally Critical and Within the Scope of the Environmental Impact Statement System Established under Presidential Decree No. 1586), proclaim certain areas and types of projects as environmentally critical, and hence within the scope of the PEISS system.

19. ECPs include the following:

(i) Heavy industries
   a. Non-ferrous metal industries
   b. Iron and steel mills
   c. Petroleum and petrochemical industries including oil and gas
   d. Smelting plants

(ii) Resource extractive industries
  a. Major mining and quarrying projects
  b. Forestry projects
    1. Logging
    2. Major wood processing projects
    3. Introduction of fauna (exotic animals) in public / private forests
    4. Forest occupancy
    5. Extraction of mangrove products
    6. Grazing
  c. Fishery Projects
    1. Dikes for/and fishpond development projects

(iii) Infrastructure Projects
  a. Major dams
  b. Major power plants (fossil-fueled, nuclear fueled, hydroelectric or geothermal)
  c. Major reclamation projects
  d. Major roads and bridges

20. ECAs include the following:
(i) All areas declared by law as national parks, watershed reserves, wildlife preserves and sanctuaries;
(ii) Areas set aside as aesthetic potential tourist spots;
(iii) Areas which constitute the habitat for any endangered or threatened species of indigenous Philippine wildlife (flora and fauna);
(iv) Areas of unique historic, archaeological, or scientific interests;
(v) Areas which are traditionally occupied by cultural communities or tribes;
(vi) Areas frequently visited and/or hard-hit by natural calamities geologic hazards, floods, typhoons, volcanic activity, etc.
(vii) Areas with critical slopes;
(viii) Areas classified as prime agricultural lands;
(ix) Recharged areas of aquifers;
(x) Water bodies characterized by one or any combination of the following conditions:
  a. tapped for domestic purposes;
  b. within the controlled and/or protected areas declared by appropriate authorities;
  c. which support wildlife and fishery activities.
(xi) Mangrove areas characterized by one or any combination or the following conditions:
  a. with primary pristine and dense young growth;
  b. near or adjacent to traditional productive fry or fishing grounds;
  c. which act as natural buffers against shore erosion, strong winds and storm floods;
  d. on which people are dependent for their livelihood.
(xii) Coral reef characterized by one or any combination of the following conditions:
  a. with 50% and above live coralline cover;
  b. Spawning and nursery grounds for fish;
  c. Which act as natural breakwater of coastlines.

21. Administrative Order No. 300 (Further Strengthening the Philippine Environmental Impact Statement System and Clarifying the Authority to Grant or Deny the Issuance of ECC), signed in 1996, confirm the power of the Secretary of the Department of Environment and Natural Resources and the DENR Regional Executive Directors to grant or deny the issuance of ECCs.

22. Section 3 of PD 1586 mandates the National Environmental Protection Council to review and evaluate the environmental impact statements on declared ECPs and ECAs. The National Environmental Protection Council and National Pollution Control Commission were merged in June 1987, and by virtue of Executive Order 192, became the Environmental Management Bureau (EMB). The EMB became a line bureau of the DENR pursuant to Republic Act 8749 (Philippine Clean Air Act) in 1999. The DENR is tasked to administer the EIS System through the EMB and its regional offices (ROs). The DENR-EMB central office reviews and processes ECPs while the DENR-EMB ROs review and approve projects considered to be located in ECAs, as well as projects outside the purview of the EIS system.

23. DENR Administrative Order No. 30, series of 2003 categorized single projects into three major groups:

- Group I: ECPs in either ECAs or Non-ECAs
  - (i) Golf course
  - (ii) Heavy industries
  - (iii) Fishery
  - (iv) Logging
  - (v) Grazing projects
  - (vi) All projects introducing exotic fauna in public and private forests
  - (vii) Major wood processing
  - (viii) Major mining and quarrying projects
  - (ix) Major listed infrastructure projects

- Group II: Non-ECPs in ECAs;
  - (i) Agriculture industry
  - (ii) Buildings, storage facilities and other structures
    - a. Chemical industries
    - b. Cottage industries
    - c. Demonstration and pilot projects
    - d. Environmental enhancement and mitigation projects
    - e. Food and related industries
    - f. Packaging materials and miscellaneous products industries
    - g. Pipeline projects
    - h. Textile, wood and rubber industries
    - i. Tourism industry
    - j. Transport terminal facilities
    - k. Waste management projects
    - l. Water supply, irrigation or flood control projects
    - m. Treasure hunting in National Integrated Protected Areas System (NIPAS)
    - n. Wildlife farming or any related projects as defined by PAWB

- Group III: Non-ECPs in Non-ECAs – All Group II project types outside ECAs

24. Environmentally critical projects require the completion of an EIA and the submission of an EIS report (Group I) while projects in ECAs (Group II) require the preparation of an IEE Report. DENR determines if a project is an ECP or if a project will be implemented in an ECA. If either or both of these conditions apply, the proposal is required to secure an ECC. Otherwise, DENR – EMB or the regional offices can issue a Certificate of Non-Coverage (CNC) certifying that the project will not significantly affect the environment (Group III).

25. **Procedural requirements and responsibilities.** The project subscribes to ADB's Safeguards Policy Statement (SPS) 2009 and all applicable national environment related laws, regulations and administrative orders. Based on the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB) Memorandum Circular (MC) 005, series of 2014 (Revised Guidelines for Coverage Screening and Standardized Requirements under the PEISS), **construction of new buildings such as schools,** including storage facilities with no hazardous or toxic materials, **with total/gross floor area that includes parking, open space and other areas of less than 1 hectare, is not covered by the PEISS.** The expansion, modification and/or rehabilitation of existing buildings requires securing or amending the ECC through the submission of an Environmental Performance Report and Management Plan to the DENR–EMB regional office where the project is located. A Building Permit must be secured from the local government unit where the facility will be constructed in compliance with Presidential Decree No. 1096 (National Building Code of the Philippines) before any type of building construction or repair work can start. All the Certificates of Non-coverage that have been secured are presented in **APPENDIX**. The project will ensure that all the remaining ECCs / CNCs that have not been secured yet will be secured prior to construction.

Table 2: Philippine Environmental Impact Assessment Requirements

Environmental Compliance Certificate Amendment	For existing facilities with issued ECC built since 1982 that will be rehabilitated, secure the ECC amendment by filing Environmental Performance Report and Management Plan (EPRMP) with DENR-EMB regional offices
Certificate of Non-coverage (CNC)	For existing facilities (with no ECC from DENR-EMB) built since 1982 that will be rehabilitated, secure CNC through the DENR-EMB online system by filing Project Description. For existing facilities built before 1982 that will be rehabilitated, secure CNC through DENR-EMB online system by filing Project Description and Proof of Project Implementation prior to 1982 without expansion / alteration / modification. For new facilities, secure CNC through the DENR–EMB online system by filing Project Description.

DENR-EMB = Department of Environment and Natural Resources – Environmental Management Bureau

C. Environmental Standards

26. The national environmental standards in the Philippines are based on Presidential Decree No. 1152 or the Philippine Environment Code, which orders the establishment of ambient air quality standards, national emission standards for new and existing stationary and mobile sources of pollution, community noise levels, standard for noise-producing equipment, classification standards for receiving bodies of water, effluent standards, guidelines for waste management, and liquid waste disposal.[1] Table below shows the National Ambient Air Quality Guideline Values as compared to World Health Organization (WHO) Ambient Air Quality Guideline Values.

[1] Presidential Decree No. 1152. Philippine Environment Code. 6 June 1977.

Table 3: National and WHO Ambient Air Quality Guideline Values

Pollutants	Short Term (24 hours averaging time), µg/m³		Long Term (1 year averaging time, µg/m³	
	Philippines	WHO	Philippines	WHO
TSP	230	-	90	-
PM_{10}	150	50	60	20
$PM_{2.5}$	50[2]	25	25	10

27. Section 74 to 79 of the issued rules and regulations of Presidential Decree (PD) 984 of the then National Pollution Control Commission in 1978 specified the noise control regulations and defined the environmental quality standards for noise in general areas. Table below shows the national environmental quality standards for noise in general areas. Subsequent table shows WHO Guidelines for Community Noise.

Table 4: National Environmental Quality Standards for Noise in General Areas

Category of Area	Maximum allowable noise by time period, dB		
	Daytime (9 AM–6 PM)	Morning and Evening (5–9 AM & 6-10 PM)	Nighttime (10 PM–5 AM)
AA – section or area which requires quietness, such as an area within 100 m from school sites, nursery schools, hospitals and special homes for the aged	50	45	40
A – residential purposes	55	50	45
B – commercial area	65	60	55
C – light industrial area	70	65	60
D – reserved as a heavy industrial area	75	70	65

Table 5: WHO Guidelines for Community Noise

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 – 22:00	Nighttime 22:00 – 7:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

28. Based on DENR Administrative Order No. 08, series of 2016 (Water Quality Guidelines and General Effluent Standards of 2016), the significant effluent quality parameters[3] applicable for the Project includes BOD, Fecal Coliform, Ammonia, Nitrate, Phosphate, Oil and Grease, and all significant parameters depending on the nature of their activity.

Table 6: Effluent Standards

Parameter	Unit	AA	A	B	C	D	SA	SB	SC	SD	WB-IFC EHS
BOD	mg/L	NDA	20	30	50	120	NDA	30	100	150	30
Ammonia – as NH3-N	mg/L	NDA	0.5	0.5	0.5	7.5	NDA	0.5	0.5	7.5	-
Fecal coliform	MPN/ 100 mL	NDA	4	200	400	800	NDA				-
Total coliform	MPN/ 100 mL	NDA	3,000	3,000	10,000	15,000	NDA	3,000	10,000	15,000	400

[2] DENR Administrative order No 20123-13. Establishing the Provisional National Ambient Air Quality Guideline Values for Particulate Matter 2.5. 7 March 2013.

[3] Education (Public and private education, including support services).

Parameter	Unit	AA	A	B	C	D	SA	SB	SC	SD	WB-IFC EHS
Nitrate as NO_3-N	mg/L	NDA	14	14	14	30	NDA	20	20	30	10[4]
Phosphate	mg/L	NDA	1	1	1	10	NDA	200	400	800	2[5]
Oil and grease	mg/L	<1	1	1	2	5	1	2	3	5	10
Total suspended solids	mg/L	NDA	70	85	100	150	NDA	70	100	150	50

Note: NDA = no discharge allowed; MPN=– most probable number

Table 7: Water Body Classification and Usage of Freshwater

Classification	Intended Beneficial Use
Class AA	Public Water Supply Class I – Intended primarily for waters having watershed, which are uninhabited and / or otherwise declared as protected areas, and which require only approved disinfection to meet the latest Philippine National Standards for Drinking Water
Class A	Public Water Supply Class II – Intended as sources of water supply requiring conventional treatment (coagulation, sedimentation, filtration and disinfection) to meet the latest PNSDW
Class B	Recreational Water Class I – Intended for primary contact recreation (bathing, swimming, etc.)
Class C	1. Fishery Water for the propagation and growth of fish and other aquatic resources 2. Recreational Water Class II – For boating, fishing, or similar activities 3. For agriculture, irrigation and livestock watering
Class D	Navigable waters

Note: For unclassified water bodies, classification shall be based on the beneficial use as determined by the Environmental Management Bureau (EMB)

Table 8: Water Body Classification and Usage of Marine Waters

Classification	Intended Beneficial Use
Class SA	1. Protected Waters – Waters designated as national or local marine parks, reserves, sanctuaries, and other areas established by law (Presidential Proclamation 1801 and other existing laws), and/or declared as such by appropriate government agency, LGUs, etc. 2. Fishery Water Class I – Suitable for shellfish harvesting for direct human consumption
Class SB	1. Fishery Water Class II – Water suitable for commercial propagation of shellfish and intended as spawning areas for milkfish (*Chanos chanos*) and similar species 2. Tourists Zone – For ecotourism and recreational activities 3. Recreational Water Class I – Intended for primary contact recreation (bathing, swimming, skin diving, etc.)
Class SC	1. Fishery Water Class III – For the propagation and growth of fish and other aquatic resources and intended for commercial and sustenance fishing 2. Recreational Water Class II – For boating, fishing, or similar activities 3. Marshy and/or mangrove areas declared as fish and wildlife sanctuaries
Class SD	Navigable waters

29. **Solid Waste**. Republic Act 9003 or the Ecological Solid Waste Management Act of 2000 governs the solid waste management in the Philippines. The policy promotes the utilization of environmentally-sound methods that maximize the utilization of valuable resources; sets guidelines and targets for solid waste avoidance and volume reduction through source reduction and waste minimization measures[6]; ensure the proper segregation, collection, transport, storage, treatment and disposal of solid waste through the formulation and adoption of the best environmental facilities; and ensure the integration of ecological solid waste management and

[4] Total nitrogen.
[5] Total phosphorus.
[6] These include composting, recycling, reuse, recovery, and others, prior to collection, treatment and disposal.

resource conservation and recovery topics into the academic curricula of formal and non-formal education to promote environmental awareness and action among citizenry.

30. **Hazardous Wastes**. Republic Act 6969, otherwise known as the Toxic Substances and Hazardous and Nuclear Wastes Control Act mandates the control and management of import, manufacture, process, distribution, use, transport, treatment and disposal of toxic substances and hazardous and nuclear wastes in the country. DENR Administrative Order No. 2000-02 or Chemical Control Order for Asbestos governs the regulations for the importation, manufacture and use of asbestos and the storage, transport and disposal of their wastes.

31. Table below contains the summary of environmental legislations applicable to the Project.

Table 9: Summary of Environmental Legislations Applicable to the Proposed Project

No.	Legislation Number	Legislation Title	Relevance to the Project	Responsible Institution
1	Presidential Decree 1151 (1977)	Philippine Environmental Policy	Project proponent is not required to prepare an environmental impact statement or initial environmental examination of proposed action, project or undertaking.	Ministry of Natural Resources (1974-1987)
2	Presidential Decree 1586 (1978)	Philippine Environmental Impact Statement System	Establishment of Philippine environmental impact statement (EIS) system based on Section 4 of Presidential Decree 1151	Ministry of Natural Resources (1974-1987)
3	Presidential Proclamation 2146 (1981)	Proclaiming Certain Areas and Types of Projects as Environmentally Critical and Within the Scope of EIS Established under PD 1586	Proclamation of areas and types of projects as environmentally critical and within the scope of Philippine EIS system	Ministry of Natural Resources (1974-1987)
4	Presidential Decree 1121 (1977)	Creating the National Environmental Protection Council	Creation of the National Environmental Protection Council as a central authority that will oversee, unify and integrate the planning, management, and implementation of the government's environment program	National Environmental Protection Council (1977 – 1987)
5	Executive Order No. 192 (1987)	Reorganization Act of the Department of Environment and Natural Resources	Providing for the reorganization of the Department of Environment, Energy and Natural Resources, renaming it as the Department of Environment and Natural Resources and for other Purposes	Department of Environment and Natural Resources (1987 – present)
6	DENR Administrative Order No. 2002-17	Defining the Organizational Structure and Major Responsibilities of the Environmental Management Bureau as a line Bureau by virtue of Section 34 of the Philippine Clean Air Act of 1999 (RA 8749)	Strengthening the enforcement and implementation of major environmental laws such as Presidential Decree 984 – Pollution Control Law; Presidential Decree 1586 – The Environmental Impact Assessment Law; Republic Act 6969 – Toxic Substances and Hazardous and Nuclear Wastes Control Act; Republic Act 8749 – Philippine Clean Air Act of 1999; and Republic Act 9003 – Ecological Solid Wastes Management Act, among others	DENR and EMB
7	DENR Administrative	Implementing Rules and Regulations for the	Incorporation of environmental considerations into the Environmental	DENR and EMB

No.	Legislation Number	Legislation Title	Relevance to the Project	Responsible Institution
	Order No. 30, (2003)	Philippine Environmental Impact Statement System	Impact Assessment (EIA) process at an early stage to streamline the current procedure in the conduct of the EIA process to improve the effectiveness as a planning, regulatory and management tool, and enhance maximum public participation	
8	Republic Act 6969 (1990)	Toxic Substances and Hazardous and Nuclear Wastes Control Act	Control and management of import, manufacture, process, distribution, use, transport, treatment and disposal of toxic substances and hazardous and nuclear wastes in the country	DENR and EMB
9	Republic Act 8749 (1999)	Philippine Clean Air Act of 1999	Comprehensive air quality management policy and program with the objective of achieving and maintaining healthy air for all Philippine citizens	DENR and EMB
10	Republic Act 9003 (2000)	Ecological Solid Wastes Management Act	Provides guidelines for ecological solid waste management program and creating the necessary institutional mechanisms and incentives as well as prohibitions and penalties	National Solid Waste Management Commission (NSWMC) and EMB
11	Republic Act 9275 (2004)	Philippine Clean Water Act of 2004	Applies to water quality management in all water bodies. Primarily applies to abatement and control of pollution from land-based sources	DENR and EMB
12	Republic Act 7586 (1992)	National Integrated Protected Areas System Act	Establishment of a comprehensive system of integrated protected areas within the classification of national park to secure the present and future generations the perpetual existence of all native plants and animals	DENR
13	DAO 08, series of 2016	Water Quality Guidelines and General Effluent Standards of 2016	Amended DAO 34 and 35 series of 1990.	DENR and EMB
14	Republic Act 10066 (2009)	National Cultural Heritage Act of 2009	Provides for the protection and conservation of the national cultural heritage, strengthening the National Commission for Culture and the Arts (NCCA) and its affiliated cultural agencies	National Commission for Culture and the Arts (NCCA)
15	Presidential Decree 953 (1976)	Requiring the planting of trees in certain places and penalizing unauthorized cutting, destruction and damaging and injuring on certain trees, plants and vegetations destruction, damaging and injuring of certain trees, plants and vegetation	Guidelines on planting of trees and penalty for cutting and damaging of trees	Bureau of Forest Development (BFD)
16	Republic Act 11058 (2018)	An Act Strengthening Compliance with Occupational Safety and Health Standards and	Aims to ensure a safe and healthful workplace for all workers by affording them full protection against all hazards in their work environment. Rules apply to contractors and	Department of Labor and Employment (DOLE)

No.	Legislation Number	Legislation Title	Relevance to the Project	Responsible Institution
		Providing Penalties for Violations thereof	subcontractors including projects in the public sector	
17	Republic Act 9729 (2009)	Climate Change Act of 2009	Mainstreaming climate change into government policy and establishing framework strategy and program for its implementation	Climate Change Commission (CCC)
18	Executive Order 174 (2014)	Institutionalizing Philippine Greenhouse Gas Inventory Management and Reporting System	Institutionalization of GHG inventory management and reporting system in relevant government agencies to ensure transition towards a climate-resilient pathway for sustainable development.	Climate Change Commission (CCC)
19	DENR Administrative Order 2013-24	Chemical Control Order (CCO)	Set a 90 ppm total lead content limit in paint. The CCO provided for a three-year phase out period from 2013 to 2016 for lead-containing paints used for architectural, decorative and household applications.	Department of Environment and Natural Resources
20	DENR Administrative Order 2000 - 02	Chemical Control Order for Asbestos	Requirements and procedures related to the importation, manufacture and use of asbestos and the storage, transport and disposal of their wastes.	Department of Environment and Natural Resources

D. Permitting Requirements

32. Table below details the procedural requirements for the expansion, modification, and/or rehabilitation of TTIs and construction of RTICs, as well as the responsibilities of TESDA, the National Project Management Unit, Regional Project Management Unit, the Project Management Consulting (PMC) Firm, the DSC Firm, and Contractors. No significant non-compliance of existing facilities with government environment requirements has been observed during various consultations with TTIs. Basic environmental and utility services (water supply, wastewater treatment, and drainage) will be improved as part of upgrading of TTI facilities. The project will ensure that all the requisite clearances and permits will be secured prior to construction, and that necessary clearances (including fire safety inspection certificate and occupancy permits are secured prior to facility operation.

Table 10: Procedural Requirements for Environmental Compliance, Construction Permits and License to Operate

Item	Procedural Requirement	Responsible Entity	Approval Entity
Pre-construction			
Facility design, permit to construct	Upgrade TESDA technology institutions and design the new regional training innovation centers following the National Building Code of the Philippines, other relevant national regulations, and international standards. Prepare the Architectural and Engineering Design and documentation (signed and sealed by architect and engineers) and other requirements to secure building permits and licenses prior to construction.	Contractor, PMC Firm, DSC Firm	TESDA, City or Municipal Engineering Office of local government units
ECC Amendment	For existing facilities with issued ECC built since 1982 that will be rehabilitated, secure the ECC amendment by filing Environmental Performance Report and	RPMU	DENR-EMB regional offices

Item	Procedural Requirement	Responsible Entity	Approval Entity
	Management Plan (EPRMP) with DENR-EMB regional offices		
CNC	For existing facilities (with no ECC from DENR-EMB) built since 1982 that will be rehabilitated, secure CNC through the DENR-EMB online system by filing Project Description. For existing facilities built before 1982 that will be rehabilitated, secure CNC through DENR-EMB online system by filing Project Description and Proof of Project Implementation prior to 1982 without expansion / alteration / modification. For new facilities, secure CNC through the DENR – EMB online system by filing Project Description.	RPMU	DENR-EMB regional offices
Local permits	Secure the Building Permit, Sanitary Permit, Electrical Permit, and other permits from the local government prior to construction.	Contractor, RPMU	LGU
Fire Safety Evaluation Clearance	Submit building plan, pertinent documents and Fire and Life Safety Assessment Report (FALAR) to the city/municipal Fire Marshal to secure the Fire Safety Evaluation Clearance prior to construction.	Contractor, RPMU	City / Municipal fire marshal
Height Clearance Permit	Submit elevation plan of proposed structure and Certification of Geodetic Engineer – i) Geodetic Coordinates (WGS-84 Datum) and True Ground Elevation in meters above mean sea level / Orthometric Height of the site; ii) Location Plan with Vicinity Map; and iii) Copy of the original field notes, traverse computations and GPS processing notes including raw data (total station data should be in ASCI format and RINEX format in GPS), signed and sealed by a Geodetic Engineer. Complete requirements can be found here - https://caap.gov.ph/height-clearance-permit-and-limitation-form/	Contractor, RPMU	Civil Aviation Authority of the Philippines (CAAP)
Tree Cutting Permit	Submit letter of application and LGU Endorsement/ Certification of No Objection from the Municipality/City and Barangay. Submit as well copy of Land Title (OCT/TCT) and photographs of trees to be removed. Please include Site Development Plan and Environmental Compliance Certificate	Contractor, RPMU	Community Environment and Natural Resources Office (CENRO) - DENR
Construction			
EMP monitoring	Monitor the implementation of the EMP by the Contractor	NPMU, PMC, RPMU	TESDA, ADB
Progress reporting	Submit quarterly progress reports on the status of construction and EMP implementation to the TESDA and PMU	NPMU, PMC, RPMU, Contractor	TESDA, ADB
Post-construction			
Fire Safety Inspection Certificate	Secure a Fire Safety Inspection Certificate from the city/municipal Fire Marshal.	Contractor, RPMU	Municipal fire marshal
Occupancy Permit	Secure an Occupancy Permit from the local government	Contractor	LGU
Completion Report	Submit a completion report with as-built drawings to TESDA during turn-over.	Contractor, RPMU	NPMU, TESDA

ADB = Asian Development Bank, CAAP = Civil Aviation Authority of the Philippines, CENRO = Community Environment and Natural Resources Office, CNC = Certificate of Non-Coverage, COCP = Code of Construction Practice, DB =

design-build, DENR = Department of Environment and Natural Resources, DSC = Design and Supervision Consulting Firm, ECC = environment compliance certificate, EMB = Environmental Management Bureau, LGU = local government unit, NPMU = National Project Management Unit, PMC = Project Management Consulting Firm, RA = Republic Act, RPMU = Regional Project Management Unit, TESDA = Technical Education and Skills Development Authority.
Source: Asian Development Bank.

E. International Conventions

33. This section reviews all the relevant international agreements and commitments, existing institutions and legislations, both at the national and local levels. The Philippines is a member of various international agreements, conventions and treaties for conservation of the environment at global level. Some of the international agreements where the Philippines is a party and applicable to the proposed Project are discussed in the following sections.

34. **United Nations Convention on Sustainable Development (UNCSD).** Also known as Rio+20 or Earth Summit 2012, the UNCSD is the third conference on Sustainable Development. It followed the 1992 Earth Summit/United Nations Conference on Environment andDevelopment . UNCSD is the key forum for the consideration of issues related to the integration of the three dimensions of sustainable development: economic development, social inclusion and environmental protection. As such, its mandate is not limited to environmental issues.

35. **Stockholm Convention, 2004.** The Stockholm Convention is a global treaty to protect human health and the environment from the adverse effects of persistent organic pollutants (POPs). Adopted in 2001 and entered into force in 2004, the convention requires its parties to take measures to eliminate or reduce the release of POPs into the environment.

36. **United Nations Framework Convention on Climate Change, 2003.** The United Nations Framework Convention on Climate Change (UNFCCC) is an international treaty focusing on what countries could do to limit average global temperature increases and the resulting climate change. The ultimate objective of the convention is the stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. In 2013, both non-Annex (including the Philippines) and Annex I members to the UNFCCC were requested to prepare their Intended Nationally Determined Contributions. Activities/Goals set under the Intended Nationally Determined Contributions, regardless of the legal nature of the contributions, will serve as the first Nationally Determined Contribution of the respective parties for the period beyond the Doha Amendment, upon ratification of the Paris Agreement.

37. **Kyoto Protocol, 2003.** The Kyoto Protocol is an international treaty under the UNFCCC. Adopted in 1997, the protocol commits 43 Annex I countries to limit their greenhouse gas emissions for the period 2008-2012 below or equal to the level of their emissions in 1990. By 2012, the Doha Amendment to the protocol was proposed to extend the protocol to a second commitment period for 2013-2020. However, only 37 countries have committed to binding targets. Binding targets for Kyoto Protocol are applicable only to Annex I (developed countries), and will end in 2020.

38. **Vienna Convention for Protection of the Ozone Layer, 1991 and Montreal Protocol on Substances Depleting the Ozone Layer, 1991:** The Vienna Convention outlines states' responsibilities for protecting human health and the environment against the adverse effects of ozone depletion, and established the framework under which the Montreal Protocol was negotiated. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere - chlorofluorocarbons , halons, carbon tetrachloride, and

methyl chloroform), are to be phased out by 2010. The project does not envisage production and consumption of ODS.

F. Regulatory Framework for Construction and Rehabilitation of Technical Education Facilities

39. The Philippine Development Plan, 2017–2022 emphasizes the need to improve the quality of TVET training programs, integrate 21st century competencies, strengthen certification, improve research and innovation, and forge stronger links between TVET institutes and industry to increase employability of Filipino workforce, including women and the youth. The National Technical Education and Skills Development Plan 2018–2022 (NTESDP) identified priority industries and employment generators of TVET subsector, namely: (i) tourism; (i) construction; (iii) information and communication technology and business process management; (iv) transport, communication and storage; (v) agriculture, fisheries, and forestry (including processing); (vi) manufacturing including food manufacturing and electronics; and (vii) health, wellness, and other social services.

40. Republic Act 11293 or the Philippine Innovation Act of 2019 adopts a state policy fostering "innovation" as a vital component of the country's development policies to drive inclusive development. The law broadly defines innovation as the creation of new ideas resulting in development of new or improved policies, products, services which are then spread or transferred across the market. It intends to harness innovation efforts to help the poor and the marginalized and enable national competitiveness of micro, small and medium enterprises in both domestic and global supply chains. Further, it identifies education institutions, private organizations, government agencies and local government units as key drivers of programs that stimulate innovation literacy and skills development for the Filipino workforce and entrepreneurs, including women and the youth.

41. TESDA has embodied in the NTESDP 2018–2022 the strategic direction for global competitiveness and workforce readiness with the objective of preparing the Philippine workforce to meet the requirements of the 4IR (TESDA Circular 060, series of 2020).

III. DESCRIPTION OF THE PROJECT

A. Project Background

42. To support the project's outcome of employability of TVET graduates and improvement in equitable access to quality TVET, one of the outputs –. The selection was based on demand and supply side considerations. The TTIs and their regional innovation centers will prioritize the economic needs of the particular province, the government's flagship "Build, Build, Build" program, and the priority sectors indicated in the National Technical Education and Skills Development Plan (NTESDP) 2018 – 2022. The project will link the TTIs and RTICs in a hub-and-spoke model with nearby higher education institutions and community-based training providers. The project will also adopt climate-smart, gender-responsive, and accessible designs while upgrading the TTIs and establishing the RTICs.

The site development plans of the 1TTIs aredetailed in **APPENDIX 1.**

Figure 1: Location Map of the Proposed Regional TVET Innovation Centers

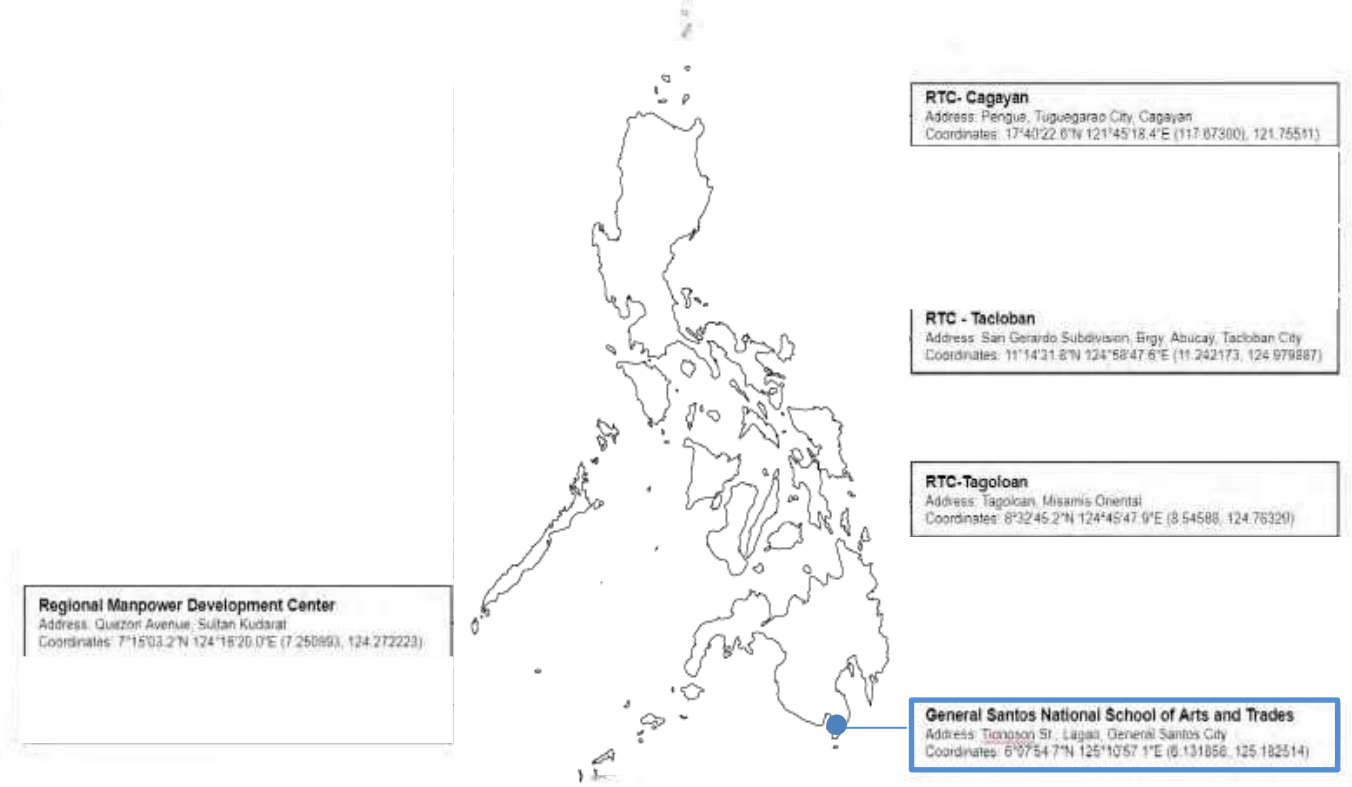


Table 11: List of First 5 TESDA Training Institutions

Region	TTI	Address	Sector and Focus Area of Innovation
II	Regional Training Center - Tuguegarao	TESDA Building, Consuelo Village, Pengue, Tuguegarao City, Cagayan	Cold Chain
VIII	Regional Training Center - Tacloban	Barangay Abucay, Tacloban City	Farm Mechanization & Automation
X	Regional Training Center - Tagoloan	Sta. Cruz, Tagoloan, Misamis Oriental	Manufacturing sector: Mechatronics, Industrial Automation and Control technology
XII	General Santos National School of Arts and Trades	Tionoson St., Lagao, General Santos City	Warehousing & Logistics Management
BARMM	Regional Manpower Development Center	RMDC Barangay Rebuken, Municipality of Sultan Kudarat, Maguindanao	Farm Mechanization & Automation

B. Design Features of TTIs and RTICs

43. The repair works of TESDA Technology Institutions (TTIs) cover improvement of dilapidated architectural members, major structural retrofitting or general rehabilitation works, upgrading of existing water supply system, drainage and sewerage system to meet environmental, electrical and safety requirements.

44. The design of the RTICs, on the other hand, draws from the expertise of international TVET practitioners to ensure compliance with industry specifications and at par with international standards. The size of the proposed innovation center will be determined by the maximum construction cost for construction and limits of the selected project site within the TESDA RTC compound or complex. The indicative cost per square meter is employed to estimate the ballpark cost only. The site location, availability of materials, and mark-up costs will also play a factor in the final construction cost. The detailed architectural and engineering plans will guide the PMU and the ADB determine the bill of materials

45. The design and construction of new building will adhere to the Philippines' national building code and integrate climate change resilience and green building features, e.g., type of construction and materials, building orientation, elevation, drainage, roofing system and windows. It will also take into consideration climate factors such as the amount of rainfall, frequency and intensity of typhoon as well as wind and solar direction. In order to ensure sufficient natural light and ventilation to the building adequate setbacks on all sides will be met; owing to the necessity of providing vehicular access for material delivery the setbacks will be in excess of those required by the building by laws.

46. The proposed RTIC building will be designed to ensure efficient use of functional areas and allocation of adequate spaces for the trainees and trainers. Related functions will be planned in proximity with each other within each floor level and between floor levels of the building. Floor to ceiling height will take into account the requirements of the training equipment to be installed and allow their effective usage. The width of the corridor will be set to allow movement of required training equipment, i.e., installation, use and subsequent maintenance and/or replacement. It will be more than the prescribed corridor width of the National Building Code; and not less than 1.8 meters.

47. **Structural design.** The structural design will be in accordance with the Philippines National Structural Code. It will take into account soil characteristics, the loads and movement of training equipment for each facility, topography of the site, and environmental conditions. The main structure will be built using concrete and suitable materials per the specification of walls and windows. Measures will be integrated in the design to avoid termite infestation, such as use of steel for the roofing system and fiber cement board with metal furring for the ceiling.

48. **Sustainable architecture.** Solar energy will be harnessed by the building by installing panels on the roof. A maximum capacity of 25 kW can be generated, which will be used for lighting the building and perimeter. Adequate access from the second/third floor to the roof area will be provided to allow the maintenance of solar panels and the roofing system. Rainwater harvesting shall also be done through collection tanks, and after filtration shall be used for irrigation and flushing.

IV. DESCRIPTION OF THE ENVIRONMENT

49. This chapter describes the environmental condition at the proposed TTI sites where rehabilitation and upgrading of select TTIs and new construction of selected 16 RTICs will be done.The REA Checklist summary is in **APPENDIX 2** while detailed baseline condition in each of theseTTIs is detailed in **APPENDIX 3**.

A. Existing Conditions at Selected TTI Sites

50. **Land availability**. All of the identified TTIs have sufficient land for the proposed rehabilitation of existing buildings and construction of new buildings.

51. **Transportation Access.** All of the identified TTIs are connected with existing national, provincial, or local roads and can be accessed through public transportation.

Table 12: Information on Location, Elevation, Road Access, and Nearest Body of Waterand Proof of Occupancy of select TTIs

Region	Name of TTI	Location		Elevation, m	Classification of Road Access	Receiving Body of Water	Distance to Body of Water, m
		Latitude	Longitude				
II	Regional Training Center-Tuguegarao	17º 40' 23" N	121º 45' 19" E	24	National Primary road	Cagayan River	2,400
VIII	Regional Training Center - Tacloban	11º 14' 32.83" N	124º 58' 47.99" E	10	Provincial road	Coalargo Bay	140
XII	General Santos National School of Arts and Trades	6º 07' 57" N	125º 10' 55" E	30	City road	Sarangani Bay	2,700
BARMM	Regional Manpower Development Center	7º 15' 04"	124º 16' 16"	12	Barangay road	Rio Grande de Mindanao	1,500

B. Existing Conditions of Proposed Regional Training Innovation Centers Sites

52. **Availability of Land and Proof of Occupancy.** All of the identified TTI sites have available land for the proposed innovation centers. The proof of occupancy includes deed of usufruct, presidential proclamation and republic act, deed of donation, tax declaration and land title.

C. Topography and Natural Hazards

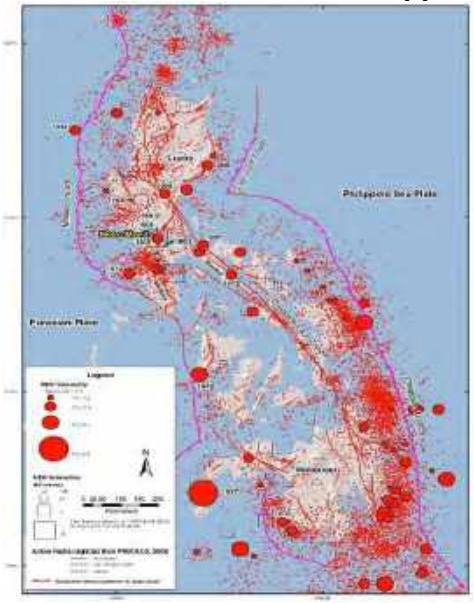
53. The Manila Observatory has developed risk maps of the Philippines' vulnerability to environmental hazards using data from the Philippine Institute of Volcanology and Seismology (PHIVOLCS) and the Earthquake and Natural Resource Atlas of the Philippines of 1998. Based on the geophysical hazards profiling, sites that are prone to earthquakes, earthquake-induced landslides, tsunamis and volcanic eruptions were identified.

54. **Earthquake**. Based on the Seismicity Map and the Earthquake Prone Areas of the Philippines, almost all regions have recorded earthquake events with moment magnitude greater than Mw 4.1, based on 25,100 historical and instrumentally recorded earthquake events from 1608 to 2016. The provinces that are at most risk to earthquakes include Leyte and South Cotabato. Leyte and and General Santos have earthquake hazards due to the Philippine Fault Zone. Leyte and General Santos City will be evaluated further during detailed design to ensure that the innovation centers will be able to withstand strong earthquakes. The same will be done for other sites, since they are also prone to earthquakes, although of lesser occurrences and magnitude.

55. In terms of earthquake hazard, the Philippines was classified as High, or more than 20% chance of potentially damaging earthquake in the next 50 years, based on ***ThinkHazard***, a web-based tool to consider the impacts of disasters on new development projects developed by the Global Facility for Disaster Reduction and Recovery (GFDRR, 2020)[7]. Regions II, VIII, X, XII, and BARMM are all classified as High.

56.

Figure 5: Earthquakes and Fault Lines in the Philippines (Wong et al., 2014)

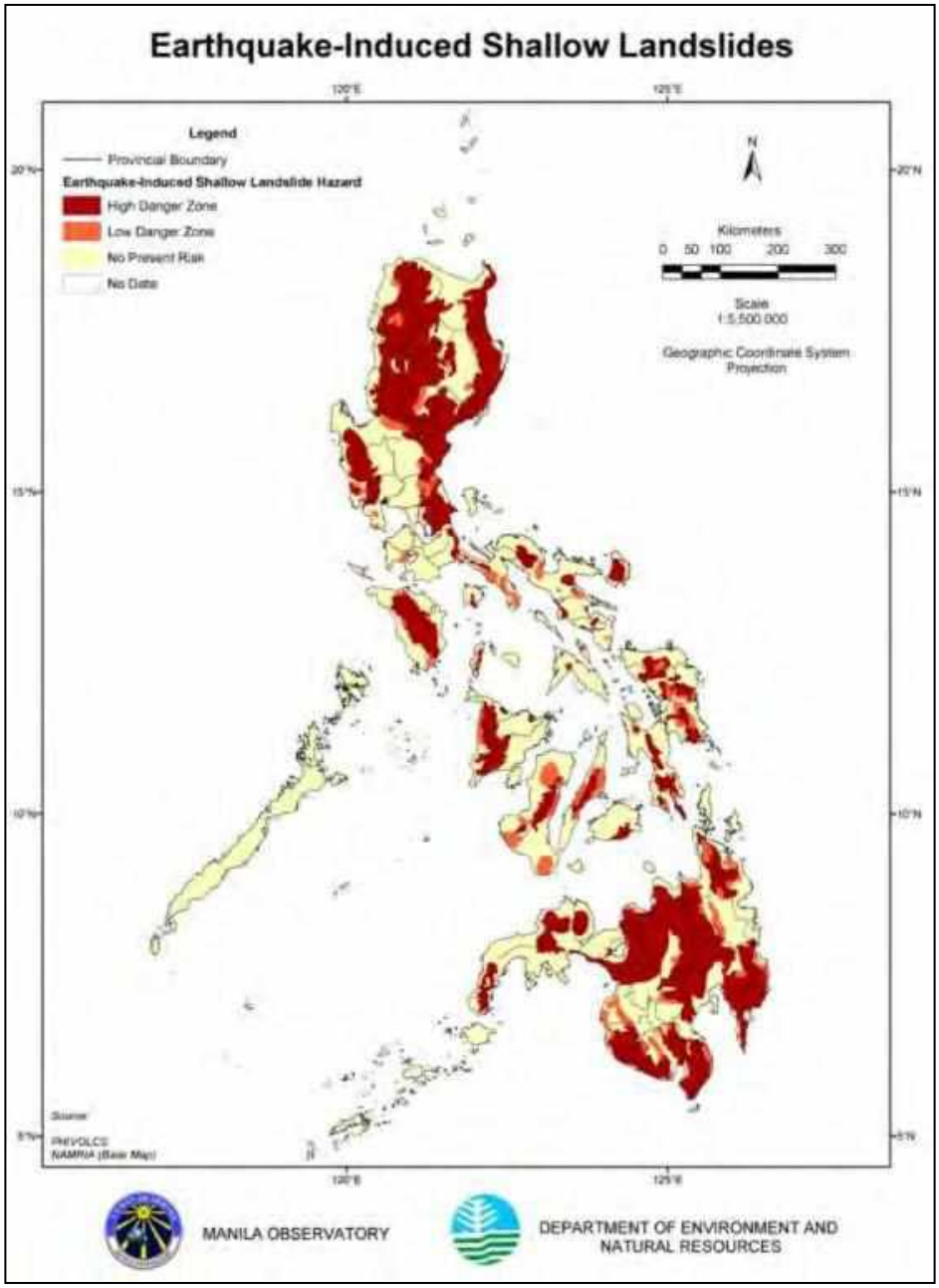


[7] Thinkhazard.org. ThinkHazard! Identify natural hazards in your project area and understand how to reduce their impact: Philippines.

57. **Earthquake-Induced Landslides.** Most of the provinces are susceptible to landslide hazards. Among the provinces selected for the project, Misamis Oriental are susceptible to landslide hazards. The susceptibility of TTI sites will be further evaluated during detailed design.

58. **Earthquake-Induced Landslides**. Most of the provinces are susceptible to landslide hazards. Among the provinces selected for the project, Misamis Oriental are susceptible to landslide hazards. The susceptibility of TTI sites will be further evaluated during detailed design.

Figure 6: Earthquake-Induced Shallow Landslides in the Philippines

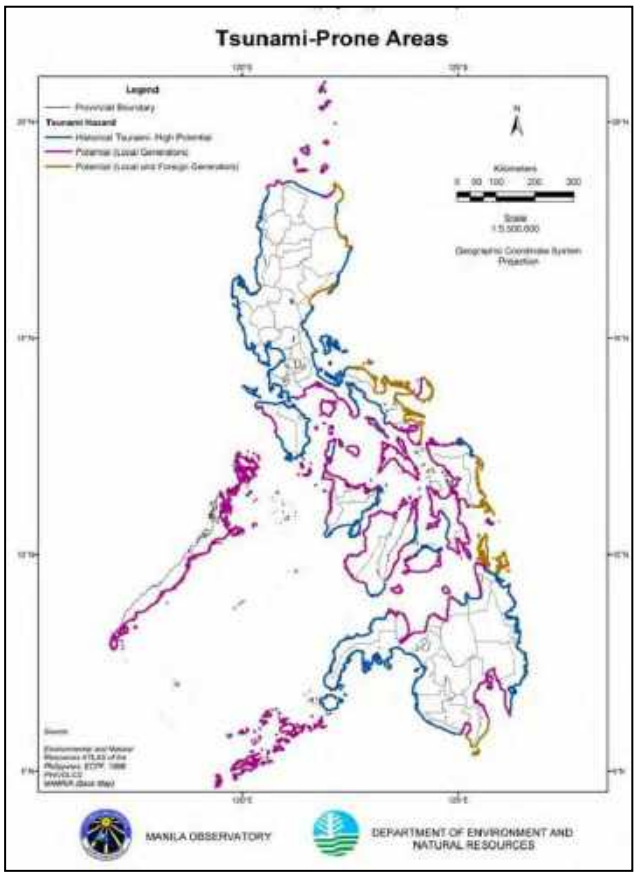


59. **Tsunamis**. Regional Training Center – Tacloban (140 m from Coalargo Bay), Regional Training Center – Tagoloan (367 m), General Santos National School ofArts and Trades (2.7 km from Sarangani Bay)), In terms of tsunami hazard, the TTIs that are most at risk from tsunami include the following:

(i) Potential (Local Generators): RTC Tacloban, RTC Tagoloan, and Davao Oriental Polytechnic Institute;
(ii) Potential (Local and Foreign Generators): General Santos National School of Arts and Trades[8]

60. The detailed design will consider the siting and design of building structures to minimize tsunami damages.

Figure 7: Tsunami-Prone Areas in the Philippines



[8] Philippine Institute of Volcanology. Tsunami-Prone Areas in the Philippines.

61. **Volcanic Eruptions.** PHIVOLCS classifies volcanoes according to its eruptive history. Active volcanoes are those that erupted within the last 600 years, and those that have written accounts of eruption within the last 10,000 years based on the analyses of materials from young volcanic deposits. Potentially active volcanoes, on the other hand, are those that are morphologically young-looking but with no historical or analytical records of eruption. Active volcanoes that are within 100 km from proposed TTIs include Mt. Parker, which is 30.72 km from General Santos National School of Arts and Trade.

Figure 8: Distribution of Volcanoes in the Philippines

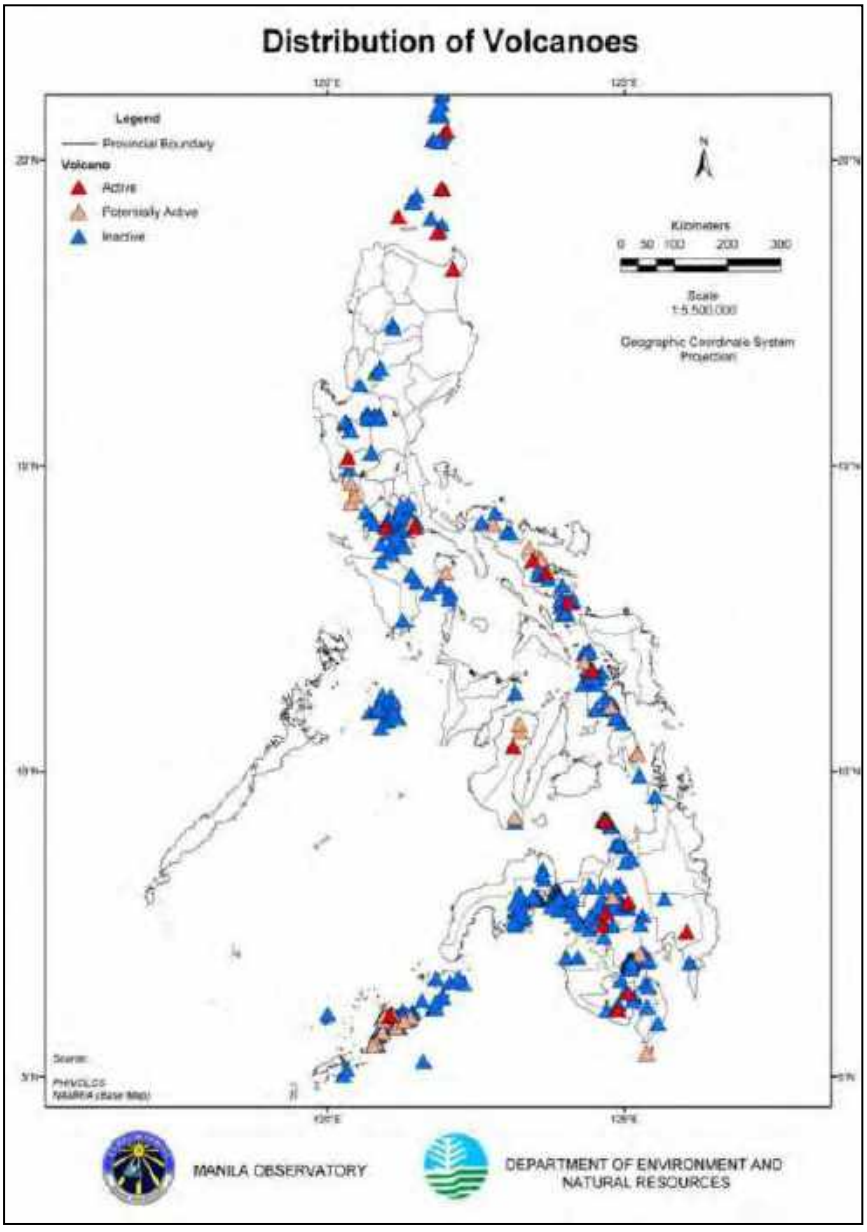
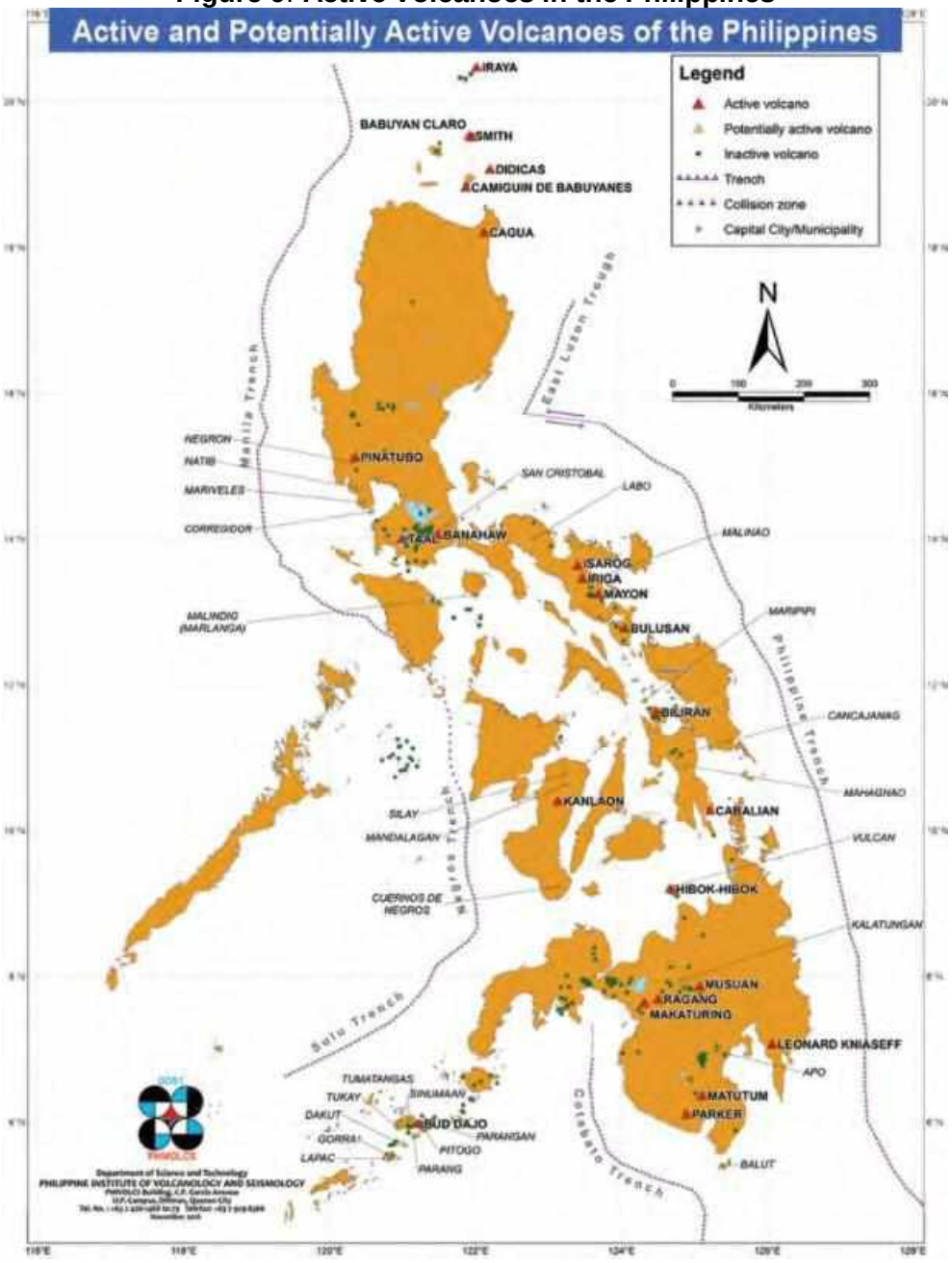
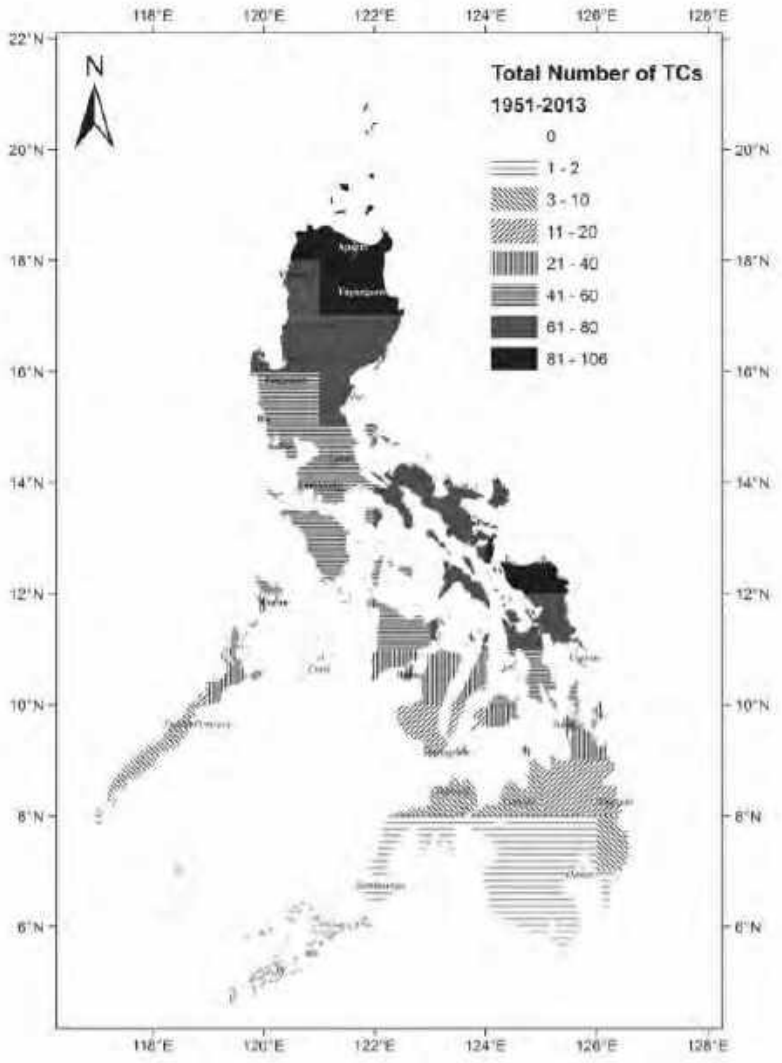


Figure 9: **Active Volcanoes in the Philippines**



62. **Tropical Cyclone (TC)**. Approximately 19-20 tropical cyclones (TCs) enter the Philippine Area of Responsibility, with about 8 or 9 of them crossing the Philippines (PAGASA, 2021), which is equivalent to 25% of global occurrence (Huigen and Jens, 2006). In terms of frequency of tropical cyclones, Region II was the most affected, with 81-106 TCs from 1953-2010, Regions XII and BARMM received the lowest number, with 1-2 TCs for the same period. The technical team will evaluate further the design of innovation centers to mitigate the impact from typhoon.

Figure 10: Frequency of Tropical Cyclones in the Philippines (1951-2013)



63. **Flooding.** Data on predicted flooding were sourced from Project NOAH or the Nationwide Operational Assessment of Hazard, the Philippines' primary disaster risk reduction and management program, which was initially managed by the Department of Science and Technology (DOST) from 2012 to 2017, but is now under the management of the University of the Philippines.

64. Based on the flooding hazard assessment of NOAH, details of Flood Hazard Maps of which are indicated in **APPENDIX 3,** the TTIs most at risk for flooding include RTC Tuguegarao and RTC Tagoloan, , where flooding may reach up to 1.5 meters during a 5-year return period. TTIs with low probability or no flooding, even a 100-year return period, include

Tacloban and General Santos National School of Arts and Trades, and Northern Mindanao School ofFisheries. The risks of flooding will be evaluated further by the technical team during detailed design.

Table 13: Flood Hazards and Return Period of select TTIs

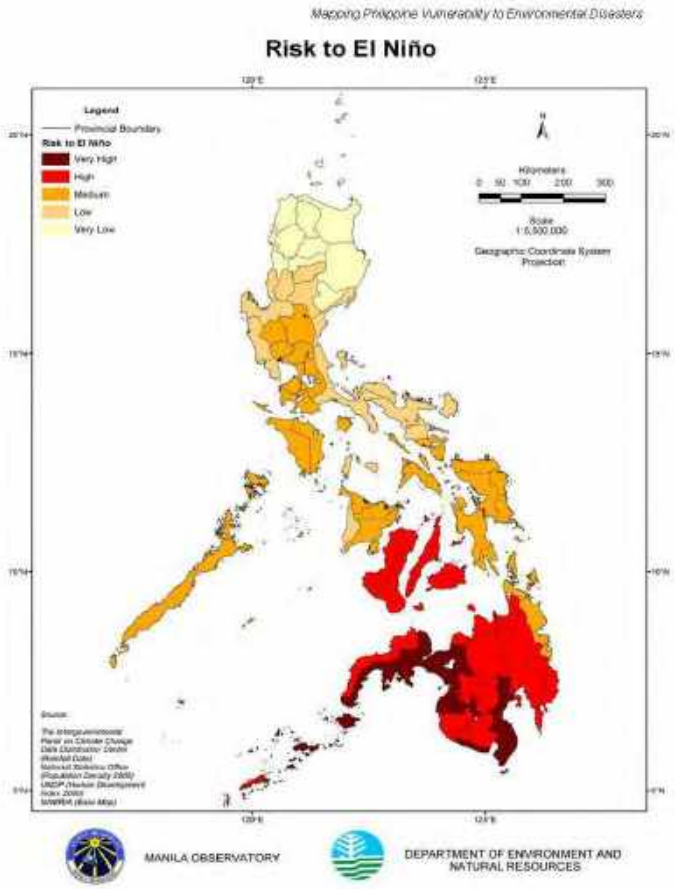
Region	Name of TTI	Flood Hazard	Flood Depth	Return Period, years
II	Regional Training Center - Tuguegarao	Low to medium	<0.5 m to 1.5m	5
VIII	Regional Training Center - Tacloban	Low	up to 0.5 m	100
X	Regional Training Center - Tagoloan	High	>1.5 m	5
XII	General Santos National School of Arts and Trades	Low	up to 0.5 m	100
BARMM	Regional Manpower Development Center	Medium to high	>0.5 m to >1.5 m	100

Note: Flood hazard – Low (≤0.5 m); Medium (>0.5 – 1.5 m); High (>1.5 m)

65. **El Niño – Induced Drought.** Areas highly at risk to El Niño – induced drought include Sultan Kudarat, Misamis Oriental and Cebu. The technical teamwill assess the sustainability of water supply for proposed infrastructure during detailed design.

66. **Rainfall Change.** The risk to projected rainfall change incorporates both decrease during the dry season and increase during the wet season. Provinces included in the Project that are most at risk to projected rainfall changes are Leyte, Misamis Oriental and Sultan Kudarat. The design team will further evaluate the impact of rainfall change in the design of innovation centers.

Figure 11: Risk to El Niño in the Philippines (1951-2013)



D. Climate

67. Philippine climate is characterized with relatively high temperature, humidity and rainfall. Rainfall varies regionally, which highly depend upon the direction of moisture-bearing winds and location of mountain ranges. The eastern parts of the country receive the highest amount of rainfall while the southernmost part of Mindanao receives the least. Based on the Modified Corona classification, the following are the four types of climate in the Philippines.

68. **Type I:** Two pronounced seasons, dry from November to April, and wet during the rest of the year. Maximum rain period is from June to September.

69. **Type II:** No dry season with a very pronounced maximum rain period from December to February. There is not a single dry month. Minimum monthly rainfall occurs during the period from March to May.

70. **Type III:** No very pronounced maximum rain period, with a short dry season lasting only from one to three months, either during the period from December to February or from March to May. This climate type resembles Type I since it has a short dry season. Provinces with this type of climate Misamis Oriental and Maguindanao.

71. **Type IV:** Rainfall is more or less evenly distributed throughout the year. This climate type resembles the second type more closely since it has no dry season. Provinces included in the project with this type of climate include Leyte.

Figure 12: Modified Coronas Classification of Climate in the Philippines

E. Air Quality and Noise

72. There are no major industrial sources of air pollution in the vicinity of the TTIs, except from vehicle sources. Sources of noise come from residential, commercial and institutional sources within the vicinity of TTIs.

F. Biological Resources

73. To determine if any TTI is located in any restricted zones of protected area or biodiversity conservation areas, Integrated Biodiversity Assessment Tool (IBAT) was used[9]. IBAT, which is a multi-institutional program of work involving BirdLife International, Conservation International,

[9] IBAT Proximity Report. Generated under licence 2099-16526 from the Integrated Biodiversity Assessment Tool on 16-18 March 2021; 21 and 24 May 2021 (GMT). www.ibat-alliance.org.

International Union for Conservation of Nature (IUCN), and UN Environment Programme World Conservation Monitoring Centre (UNEP WCMC). The tool intends to provide a basic risk screening on biodiversity. Adjacent protected areas and key biodiversity areas within 10 km of TTI, using the IBAT tool are detailed in **APPENDIX 4**.

74. **Protected Areas**. The following TTIs are within 10 km of buffer zones of protected areas: RTC Tuguegarao (10 km), RTC Tacloban (10 km), General Santos National School of Arts and Trades (5 km).

75. **Key Biodiversity Areas**. Buffer zones of key biodiversity areas that are within 10 km from TTIs include: RTC Tuguegarao (10 km)

Table 14. Protected and Key Biodiversity Areas Near TTIs

No.	Region	Name of TTI	Protected Area	Key Biodiversity Area
3	II	Regional Training Center - Tuguegarao	Peñablanca Protected Landscape and Seascape (within 10 km of buffer zone)	Peñablanca Protected Landscape and Seascape (within 10 km of buffer zone)
11	VIII	Regional Training Center - Tacloban	MacArthur Landing National Park (Imelda Park) (within 10 km of buffer zone)	No key biodiversity area within buffer distance
13	X	Regional Training Center - Tagoloan	No protected area within buffer distance	No key biodiversity area within buffer distance

No.	Region	Name of TTI	Protected Area	Key Biodiversity Area
15	XII	General Santos National School of Arts and Trades	Sarangani Bay Protected Landscape (within 5 km of buffer zone)	No key biodiversity area within buffer distance
17	BARMM	Regional Manpower Development Center	No protected area within buffer distance	Liguasan Marsh (1 km)

G. Power, Water and Telecommunications Infrastructure

76. All TTIs are connected with the electric grid provided by electric utility companies or cooperatives. Some TTIs source their water from the community water supply, while others have back-up deep well and overhead water tanks. Internet connections vary from 5 Mbps (copper cable) in RTC - Iloilo, up to 1 Gbps (fiber optics) in RTC - Tuguegarao.

Table 15. Power, Water and Telecommunication Infrastructure

No.	Region	Name of TTI	Power	Water	Telecommunication
1	CAR	Regional Training Center - Baguio	220VAC Three-phase electrical connection	Community water supply	Fiber Optic: 100 Mbps
2	I	Pangasinan Technological Institute	220VAC Single Phase (220VAC-Neutral/Ground) electrical connection	Community water supply Deep-well (operated and maintained by the TTI) 2 Overhead tanks: 500L and 1000L	Copper Cable: 60 Mbps Fiber Optics: 200 Mbps
3	II	Regional Training Center - Tuguegarao	220VAC, 3phase 220VAC, Single phase	Deep-well (operated and maintained by the TTI) Gravity type concrete water tank (2 units)	Fiber Optic: 50 Mbps 1 Gbps
4	III	Regional Training Center Central Luzon - Guiguinto	220VAC Three-phase electrical connection	Deep-well (operated and maintained by the TTI)	Fiber Optics: 30 Mbps
5	NCR	Regional Training Center - NCR	220VAC Three-phase electrical connection	Community water supply Overhead water tank and Firefighting water backup tank	Fiber Optics: 100 Mbps
6	IV-A	Regional Training Center - CALABARZON	240VAC One-phase electrical connection 240VAC Three-phase electrical connection	Community water supply	Copper Cable 10 Mbps Fiber Optics: 100 Mbps
7	IV-B	Provincial Training Center Oriental Mindoro – San Teodoro	220VAC, 3 phase / 220VAC, 1 phase	No data	Copper cable: 10 Mbps
8	V	Regional Training Center - Pili	220VAC Three-phase electrical connection	Community water supply	Fiber Optics: 50 Mbps

No.	Region	Name of TTI	Power	Water	Telecommunication
				Deep-well (operated and maintained by the TTI) Overhead Bolted Steel Tank/ 1M Gallon	
9	VI	Regional Training Center - Iloilo	300 kVA 3-phase open delta	Water is delivered (with water shortage)	Copper cable: 5 Mbps
10	VII	Regional Training Center - Cebu	220VAC Three-phase electrical connection	Deep-well (operated and maintained by the TTI) Overhead Tank, Concrete, 3 m x 3 m x 3 m	Copper Cable: 15 Mbps
11	VIII	Regional Training Center - Tacloban	220VAC Three-phase electrical connection	Community water supply	Fiber Optics: 50 Mbps
12	IX	Regional Training Center – Zamboanga Peninsula	220VAC Single Phase electrical connection 220VAC Three-phase electrical connection	No data	DSL: 10 Mbps Broadband: 20 Mbps
13	X	Regional Training Center - Tagoloan	220VAC Three-phase electrical connection	Deep-well (operated and maintained by the TTI) Overhead Tank, Concrete, 40 m^3	Wireless: 50 Mbps Fiber Optics: 10 Mbps Broadband: 10 Mbps
14	XI	Davao Oriental Polytechnic Institute	220VAC 60 Amp, 1 phase	Deep-well (operated and maintained by the TTI)	8 Buildings with 20mbps and 1 Building with 50mbps
15	XII	General Santos National School of Arts and Trades	220VAC Single Phase (220VAC-line to line) electrical connection 220VAC Three-phase electrical connection	Community water supply Deep-well (operated and maintained by the TTI) Overhead Concrete Tank, 12.5 m^3 powered by 1.5 Hp electric motor pump	Fiber Optics: 300 Mbps
16	CARAGA	Northern Mindanao School of Fisheries	220VAC One-phase electrical connection	Community water supply	Fiber Optics: 10 Mbps; 100 Mbps; 500 Mbps
17	BARMM	Regional Manpower Development Center	220VAC Three Phase (220VAC-line to line) electrical connection	Deep-well (operated and maintained by the TTI) Pressurized and Overhead tank	Airfiber: 20 Mbps

H. Climate Risk Vulnerability Assessment

1. Background

78. The Philippines is highly vulnerable to climate change impacts, which includes increased frequency of extreme weather events, sea level rise, rising temperatures, and extreme rainfall (USAID, 2017).[10] This is because of the country's high exposure to natural hazards such as typhoons, landslides, floods and droughts), dependence on natural resources which are sensitive to climate change, and the long coastlines where all major cities and bulk of the population reside. There are about 19-20 typhoons in the Philippines each year, of which about 7-9 make landfall. Sea levels are also rising faster than the global average, increasing storm surges and inundation hazard.

79. As a party to the United Nations Framework Convention on Climate Change, the country adopts its objective of stabilizing greenhouse gas concentrations in the atmosphere, to ensure that food production is not threatened and to ensure economic development to proceed in a sustainable manner. As one of the parties to the Hyogo Framework for Action, the country also adopts the strategic goals to build national and local resilience to climate change-related disasters. The Philippines has adopted Republic Act 9729 or the Climate Change Act of 2009 to provide the policy framework to systematically address the growing threats on community life and its impact on the environment.

80. The National Framework Strategy on Climate Change was adopted in April 2010 following the passage of Republic Act 9729 in 2009 (amended in 2012). The framework has been translated into a National Climate Change Action Plan for 2011–2028, which prioritizes food security, water sufficiency, ecological and environmental stability, human security, climate-smart industries and services, sustainable energy, and knowledge and capacity development. The Philippines ratified the Paris Agreement on March 23, 2017, with the objective of limiting global warming to well below 2, preferably to 1.5 ºC compared to pre-industrial levels. The Philippines' Nationally Determined Contribution is to reduce GHG (CO_2 equivalent) emissions by 70% by 2030 compared to the business-as-usual scenario of 2000-2030. Reduction of CO_2 equivalent emissions will come from energy, transport, waste, forestry and industrial sectors.

2. Climate Baseline Conditions

81. The Philippines has exhibited increasing temperatures of 0.64 °C or an average of 0.01 °C per year-increase from 1951–2010. Maximum (daytime) and minimum (nighttime) temperatures are also seen to have increased by 0.36 °C and 0.1 °C, respectively in the last 59 years. There has also been a slight increase in the number of typhoons in the Visayas during the 30-year observation period from 1971-2000 compared with the 1951-1980 and 1960-1990 periods (PAGASA, 2011).

3. Future Climate Scenarios

82. According to Observed Climate and Projected Climate Change in the Philippines (Department of Science and Technology – PAGASA, 2018), observed temperature in the country is warming at an average rate of 0.1 ºC every decade. Assuming the moderate emission scenario

[10] Climatelinks – A Global Knowledge Portal for Climate and Development Practitioners. Climate Risk Profile: Philippines. *USAID Factsheet* (accessed 20 April 2021).

(RCP4.5), it is projected that the country-averaged mean temperature could increase by 0.9 C to 1.9 C, and 1.2 C to 2.3 C (considering the high emission scenario or RCP8.5) in mid-21st century.

83. Rainfall, on the other hand, is projected to be within the natural rainfall variations, except for the projected rainfall reduction over central sections of Mindanao. The projection is based on multi-model central estimate of projected changes in rainfall (Observed Climate and Projected Climate Change in the Philippines, DOST- PAGASA, 2018). It was likewise projected, based on the same study, that the high year-to-year variations in the frequency of occurrence and intensity of tropical cyclones will remain.

84. It was also projected by DOST-PAGASA that the sea level in the country will increase by approximately 20 cm by the end of the 21st century under RCP8.5 scenario. The projected increase in sea level is expected to worsen storm surge hazards in coastal communities.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

A. Impact Assessment

85. This section will identify the impacts of the proposed construction of innovation centers and other facilities on the physical, biological, and socio-economic environment of proposed TTIs. The identification of impacts was based on the project design, location, proposed activities during construction and operation, secondary information from national government agencies and online resources, and information gathered from consultations with safeguards focals of the select TTIs conducted from 8 – 22 February 2021, and with safeguards focals of 6 new TTIs on 26-28 May 2021.

86. Prior to the impact assessment process, two broad requirements are needed:

a. What is in the receiving environment that may be affected by the project activities?
b. What are the project activities that may affect the receiving environment?

87. The first requirement determines the elements of the environment that are considered important. This is called Valued Environmental Receptors (VERs). The second requirement will be listed, based on similar projects funded by ADB, and the proposed program of works (POW).

B. Valued Environmental Receptors

88. Valued Environmental Receptors (VERs), which include the elements of the receiving environment which are considered to be important, were identified, based on review of available information and consultations with stakeholders. VERs are defined as fundamental elements of the physical, biological or socio-economic environment, including the air, water, soil, terrain, vegetation, fauna and land use that may be affected by a proposed project.

Table 16: Valued Environmental Receptors

Environment	Valued Environmental Receptors	Rationale and Relationship to the Project
Physical	Project location	**Earthquake hazards**. Regions II, VIII, X, XI, XII and BARMM are all classified as High (Global Facilityfor Disaster Reduction and Recovery, 2020). Regions IV-A, V, IX and NCR are considered medium.

Environment	Valued Environmental Receptors	Rationale and Relationship to the Project
		Earthquake-induced landslides. Misamis Oriental are susceptible tolandslide hazards.
		Volcanic eruptions. Active volcanoes that are within 100 km from proposed TTIs include Mt. Parker, which is 30.72 km from General Santos National School of Arts and Trade.
		Tropical cyclones. Region II was the most affected, with 81-106 TCs from 1953-2010. BARMM received thelowest number, with 1-2 TCs for the same period. Region VIII also experienced Haiyan in 2013.
		Tsunami. Potential tsunami generators in RTC Tacloban, RTC Tagoloan, Davao Oriental Polytechnic Institute, and General Santos National School of Arts and Trades.
	Land and soil condition	Construction timing is important though as rainy and windyseason impacts the soil condition.
	Topography and elevation	**Flooding**. The TTIs most at risk for flooding include RTC Tuguegarao, RTC Tagoloan, where flooding may reach up to 1.5 meters during a 5-year return period. TTIs with low probability or no flooding, even a 100-year return period, include RTC – Tacloban, General Santos National School of Arts and Trades.
	Receiving body of water	Effluent from gray water will contribute to water quality of nearby receiving bodies of water. Quality of effluent must be ensured prior to release to receiving water.
	Ground water	Regions II, X, XI, XII and BARMM depend on deep well for domestic water supply. Both quantity and quality of water must beensured.
	Climate change	Climate change impacts include increased frequency of extreme weather events, sea level rise, rising temperatures, and extreme rainfall. **El Niño – induced drought.** Areas highly at risk to El Niño – induced drought include, Sultan Kudarat and Misamis Oriental. **Rainfall change**. Provinces included in the Project that are most at risk to projected rainfall changes are Leyte, Misamis Oriental and Sultan Kudarat. The design team will further evaluate the impact of rainfall change in the design of innovation centers.

Environment	Valued Environmental Receptors	Rationale and Relationship to the Project
Biological	Protected areas and key biodiversity areas	**Protected areas**. The following TTIs are within 10 km of buffer zones of protected areas: RTC Tuguegarao (10 km), RTC Tacloban (10 km), General Santos National School of Arts and Trades (5 km). **Key biodiversity areas**. Buffer zones of key biodiversity areas (KBAs) that are within 10 km from TTIs include: RTC Tuguegarao (10 km)
	Flora and Fauna	Trees will be cut in Regions II, VIII, and BARMM
	Fauna	The Regional Manpower Development Center in BARMM, on the other hand, is covered by the IBA of Liguasan Marsh.
Socio-economic	Access to technical and vocational education	The rehabilitation and construction of TTIs and RTICs will provide access to quality technical and vocational education in the selected regions.
	Infrastructure and access	All of the identified TTIs are connected with existing national, provincial, or local roads and can be accessed through public transportation.
		Existing TTI buildings will be demolished in Region II.
	Water supply	All selected TTIs have dependable water supply. Sources include communitywater supply and/or deep well. Some TTIs have overhead tank for water storage.
	Vehicle traffic	The proposed construction of innovation centers and other facilities will entail the transportation of construction materials which may obstruct the flow of traffic where the construction vehicles will pass through.
	Acoustic environment	Construction of innovation centers and other facilities will generate noise that may impact both workers, students and faculty of TTIs, and surrounding community.
	Community and occupational health and safety	During construction of innovation centers and other facilities, there are risks on the health and safety of workers and the community, which may lead to injury and/or death. TTI buildings to be rehabilitated may potentially contain asbestos or asbestos-containing materials that could put workers at risk.

89. **Project Activities.** The following project components and activities per phase that will have substantial interaction with the environment were identified:

(i) Preconstruction stage:
   a. Location and design of RTIC and other facilities
   b. Consultation and securing of clearances from government agencies
   c. Land survey
   d. Survey of vegetation and tree cutting
   e. Survey of TTI facilities that will be rehabilitated / replaced, including buildings to be demolished
   f. Traffic planning
   g. Capacity building on safeguards implementation and grievance redress

(ii) Construction Phase
   a. Site mobilization and construction of temporary facilities - establishment of storage areas for construction materials, mobilization of construction equipment and perimeter fencing
   b. Management of wastes from demolished and/or repaired buildings
   c. Construction of RTICs
   d. Construction of dormitories and operation of other associated and related facilities
   e. Management of construction activities- worker camps, stockpiles, solid wastes and wastewater

(iii) Post-Construction Phase
   a. Demobilization
   b. Operation of RTICs and other facilities
   c. Management of wastes from TVET activities
   d. Monitoring

90. The assessment of impacts, both quantitatively and qualitatively, are based on the REA checklist (**APPENDIX 2**), and infrastructure and environmental questionnaires. Due to COVID-19 travel restrictions, consultations with safeguard focals of TTIs were conducted online from 8–22 February 2021, and 26–28 May 2021 with 6 new TTIs. Review of literature and environmental studies were also done.

91. These impacts can be classified as major, moderate, minor and negligible. Some of the impacts associated with the construction of RTICs include impacts on land, vegetation, receiving body of water, occupational health and safety during demolition or repair of old buildings (including potential exposure to asbestos or asbestos-containing materials), air quality impacts. Prevalent impacts during operation phase includes the management of solid waste and wastewater, sustainability of building and facilities, and climate change.

C. Evaluation of Impacts

1. Beneficial Impacts

92. The project is expected to have positive impact on the quality of TVET in the Philippines. Students who intend to pursue TVET will directly benefit from upgraded curriculum geared towards 4IR, and better facilities in innovation centers.

2. Adverse Impacts

93. The identification of potential negative impacts requires the identification of the components of physical, biological and socio-economic environment that are at risk from the proposed construction of innovation centers and other facilities such as dormitories. A modified Leopold matrix, involving interactions between valued environmental receptors and project activities are proposed.

94. Negative impacts can be mitigated through good construction management practices while positive impacts will be further enhanced. Impacts from the proposed projects are classified into intensity, duration and scope. Intensity refers to the level of disruption, duration pertains to the time dimension of impact, while scope refers to the spatial impact. These can be further classified into different levels, as shown in the next table.

Table 17: Intensity, Duration and Scope Classification of Impacts

Intensity: Level of impacts	Duration: Time dimension of impacts	Scope: Spatial dimension of the effect
Low: Little change in the characteristics of the component. Difficult to quantify	Short-lived: Effect dissipates easily	Regional: Action affects areas outside TTIs
Average: Change in certain characteristics of the components. Change may be quantified	Temporary: Effect does not last. Effect is felt during one project activity or throughout project implementation	Local: Action affects areas within TTIs
High: Change in all or in the main characteristics of the component. Change is quantifiable	Permanent: Effect leaves lasting impact for the life of the infrastructure	Limited: Action affects only the innovation center footprint of the project

95. The three parameters – intensity, duration and scope are incorporated to form multicriteria matrix that can be categorized into the following: Major – effect is permanent that substantially alters the environment quality; Medium – signifies temporary and perceptible effect that has little effect on the environmental component and can be reversed, the effect is only limited and short-lived; and Minor – effect does not affect the environmental component in qualitative or quantitative terms, that is, the effect is short-lived and very limited in scope.

Table 18: Multi-criteria Analysis to Determine the Potential Environmental Impacts

Intensity	Duration / Scope	Short-lived	Temporary	Permanent
Low	Limited	MIN	MIN	MED
	Local	MIN	MIN	MED
	Regional	MIN	MED	MED
Medium	Limited	MIN	MED	MED
	Local	MED	MED	MAJ
	Regional	MED	MAJ	MAJ
High	Limited	MED	MAJ	MAJ
	Local	MED	MAJ	MAJ
	Regional	MAJ	MAJ	MAJ

Table 19: Matrix Showing the Relationship Between VERs and Project Components and Activities for the Construction of Innovation Centers

Valued Environmental Receptors	Project Phases															
	Pre-construction							Construction						Operation		
	Location and design of RTIC and other facilities	Consultation and securing of clearances from government agencies	Land survey	Survey of vegetation and tree cutting	Survey of old facilities that will be rehabilitated / replaced, including buildings to be demolished	Traffic planning	Capacity building on safeguards implementation and grievance redress	Site mobilization and construction of temporary facilities - establishment of storage areas for construction materials	Mobilization of construction equipment and perimeter fencing	Management of wastes from demolished buildings	Construction of RTICs	Construction of dormitories and other associated and related facilities	Management of construction activities-worker camps, stockpiles	Demobilization	Operation of RTICs and other facilities	Monitoring
Physical Environment																
Project location	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓		✓	
Land and soil condition	✓		✓		✓			✓	✓		✓	✓ ✓		✓		
Topography and elevation	✓		✓					✓				✓ ✓				
Receiving body of water	✓		✓		✓			✓	✓	✓	✓	✓ ✓	✓	✓	✓	✓
Ground water	✓				✓			✓	✓	✓	✓	✓ ✓	✓	✓	✓	✓
Air quality and noise level	✓				✓			✓	✓	✓	✓	✓ ✓	✓	✓	✓	✓
Climate	✓											✓ ✓			✓	
Biological Environment																
Protected areas and key biodiversity areas	✓		✓	✓							✓	✓	✓			
Flora	✓		✓	✓				✓	✓		✓	✓	✓		✓	✓
Fauna	✓										✓	✓	✓		✓	✓
Socio-economic Environment																
Access to technical and vocational education		✓			✓		✓				✓				✓	✓
Infrastructure and access	✓	✓	✓		✓	✓	✓	✓	✓		✓		✓	✓	✓	✓
Water supply	✓				✓			✓	✓		✓	✓	✓	✓	✓	✓
Vehicle traffic	✓	✓				✓		✓	✓		✓		✓	✓	✓	✓
Acoustic environment	✓	✓			✓	✓		✓	✓		✓	✓		✓	✓	✓

Table 20: Analysis of Environmental Impacts

Project Components	Environmental Components	Description of Environmental Effects	Intensity	Duration	Scope	Assessment of Potential Negative Impacts
Preconstruction Phase						
Location and design	Project location	Geological and natural hazards	High	Permanent	Regional	Major
	Topography and elevation	Flooding risks	High	Permanent	Regional	Major
	Climate	Climate change impacts	High	Permanent	Regional	Major
	Protected areas	Potential impacts on biodiversity	Medium	Permanent	Regional	Medium
	Vegetation	Loss of trees	Medium	Permanent	Limited	Medium
	Fauna	Loss of fauna	Low	Temporary	Limited	Minor
	Hazardous wastes, including asbestos	Impacts on land, air, water, flora and fauna and health and safety of workers and the community	High	Permanent	Regional	Major
Construction Phase						
Mobilization of construction equipment and construction of temporary facilities; Demolition of existing buildings; Construction of innovation centers and dormitories	Land and soil condition	Disturbance of land and soil condition	High	Temporary	Limited	Major
	Land and soil condition	Generation of wastes, including hazardous wastes from buildings to be demolished	High	Temporary	Limited	Major
	Surface water quality	Deterioration of water quality	Medium	Temporary	Local	Medium
	Air quality and noise	Increase in particulate matter and noise level	High	Temporary	Local	Major
	Vegetation	Loss of trees	Medium	Temporary	Local	Medium
	Ground water	Reduced water supply from groundwater	Medium	Temporary	Local	Medium
	Fauna	Loss of fauna	Low	Temporary	Limited	Minor
	Public infrastructure and access	Temporary disturbance of access	Medium	Temporary	Local	Medium
	Water supply	Increased level of use of water	Medium	Temporary	Local	Medium
	Vehicle traffic	Increased level of traffic	Medium	Temporary	Local	Medium
	Occupational health and safety	Impact on health and safety of workers	High	Short-lived	Local	Medium
	Community health and safety	Impact on health and safety of community	High	Short-lived	Local	Medium
Operation Phase						
Demobilization	Land and soil condition	Compaction of soil	Low	Temporary	Limited	Minor
	Surface water quality	Increase in level of pollutants	Low	Temporary	Limited	Minor
	Air quality	Increase level of particulate matter	Low	Temporary	Limited	Minor
	Ambient noise	Increased level of noise	Low	Temporary	Limited	Minor
	Vehicle traffic	Increased level of traffic	Low	Temporary	Limited	Minor
	Community health and safety	Impact on the community	Low	Temporary	Limited	Minor
Operation of innovation centers and dormitories	Climate	Climate change impacts	High	Permanent	Regional	Major
	Land	Generation of solid wastes from TVET activities	Medium	Temporary	Local	Medium
	Surface water quality	Potential deterioration of water quality	High	Temporary	Regional	Medium

Project Components	Environmental Components	Description of Environmental Effects	Intensity	Duration	Scope	Assessment of Potential Negative Impacts
	Water supply	Additional strain to existing water resource	Medium	Temporary	Local	Medium
	Vehicle traffic	Traffic generation	Medium	Temporary	Local	Medium
	Air quality	Increase in level of particulate matter	High	Temporary	Local	Medium
	Receiving body of water	Deterioration of water quality	Low	Temporary	Local	Minor
	Ground water	Reduced water supply from groundwater	Medium	Temporary	Local	Medium
	Occupational health and safety	Risks from handling of equipment	Medium	Permanent	Regional	Medium

96. The analysis of impacts shown in the preceding table revealed the following:

(i) During the pre-construction phase, major risk and potential negative impact include geological, natural and physical hazards, flooding risks and climate change impacts; and medium impacts on biodiversity and loss of trees.

(ii) During construction, major potential impacts include disturbance of land and soil condition and generation of wastes, including hazardous wastes from buildings to be demolished, and from rehabilitated TTIs and construction of innovation centers, and impact on air quality and noise level; and medium impacts on the following: surface water quality, loss of vegetation, reduced water supply from ground water, temporary disturbance of access, increased level of use of water, increased level of vehicle traffic, and health and safety of workersand the community.

(iii) During operation, major impacts include climate change while medium for generation of solid wastes from TVET activities, potential deterioration of water quality, additional strain to existing water resource, traffic generation, increase in level of particulate matter, deterioration of water quality, reduced water supply from groundwater, and risks of students and workers from handling equipment.

D. Negative Impacts and Mitigation

1. Pre-construction Phase

97. The construction of innovation centers and rehabilitation of TTIs will be done exclusively at the selected TTI sites. Impacts due to project location include geological hazards such as earthquake and volcanoes, vulnerability to tropical cyclones and flooding, and proximity to areas with high biodiversity, and loss of trees. As some buildings will be demolished in NCR, CAR, Region I, Region II and Region III, and some TTIs will be rehabilitated or expanded, there is a potential that hazardous wastes including asbestos or asbestos-containing materials (ACM) are present in buildings affected. The design of buildings, facilities and other associated infrastructure necessary for the construction and operation of RTICs and other facilities will be evaluated further during detailed design stage.

98. The following are the major environmental issues associated with project location.

a. Geological Hazards

99. **Earthquake Hazards**. In terms of earthquake hazards, Regions II, VIII,X, XI, XII, and BARMM are all classified as High (Global Facility for Disaster

Reduction and Recovery, 2020). The project will conduct geotechnical survey during detailed design to further evaluate the hazards from active faults close to the TTIs that may trigger earthquakes. The project will also be in compliance with the National Structural Code of the Philippines and other applicable codes, standards and regulations.

100. **Volcanoes**. Mt. Parker, which is 30.72 km from General Santos National School of Arts and Trade. Volcano hazards associated with eruption include lava flow, ash fall, pyroclastic flow, lateral blast and volcanic gas. The project will utilize the Volcano Information Materials from PHIVOLCS to educate the TTI stakeholders on the needed actions to prepare for volcanic eruptions.

b. Natural Hazards

101. **Tropical Cyclones.** Region II was the most affected, with 81-106 TCs from 1953-2010, while VIII received about 61-80 TCs for the same period. The design of innovation centers will take into consideration the impacts of severe tropical cyclones.

102. **Flooding.** The TTIs most at risk for flooding include RTC Tuguegarao and RTC Tagoloan where flooding may reach up to 1.5 meters during a 5-year return period.
The design of innovation centers and other facilities will consider flooding risks and incorporating mitigating measures such as raising the floor height of buildings and increasing capacity of drainage.

103. **Vulnerability to climate change**. Increased temperature in the TTIs may lead to decreased ground water supply for innovation centers, increased need for ventilation and additional energy for air conditioning. The projected rainfall reduction over central sections of Mindanao, will likewise impact on TTI's water supply. The high variability in the frequency of occurrence and intensity of tropical cyclones will impact on the integrity of the buildings, specifically in Region II, and VIII. The projected sea level rise of 20 cm by the end of the 21st century will likewise impact TTIs located near coastal areas, as this will worsen storm surge hazards in these areas.

104. **Impacts on biodiversity**. The construction of innovation centers and other facilities will not lead to loss of biodiversity or critical habitat since all activities will only be confined within TESDA sites. To coordinate with the Department of Environment and Natural Resources and Ministry of Environment, Natural Resources and Energy (MENRE) regional office to ensure compliance with local environmental requirements.

105. **Loss of trees**. Based on the initial survey from selected sites, trees will be affected in the following regions, arising from the construction of RTICs: II, VIII, XII, CAR and BARMM.

TTIs will coordinate with the Community Environment and Natural Resources Office (CENRO) with jurisdiction over the TTI, on requirements and mitigating measures (including replacement of cut trees) to lessen impacts of cut vegetation.

c. Physical Hazard

106. **Hazardous wastes from buildings to be demolished or rehabilitated.** There is a potential that hazardous wastes, including asbestos, are present in buildings affected. To ensure compliance with relevant regulations, the Project will refer to DENRAdministrative Order (DAO) No. 2000 – 02 (Chemical Control Order for Asbestos), particularly Section IX, Specific Requirements and Standards, item 6 – Renovation, Removal and Demolition Requirements. Based on the DAO, the duly authorized owner or operator, in this case the TTI, through the Design and Construction Supervision Consulting (DSC) Firm, shall thoroughly inspect and assess the facility to verify the presence of any friable asbestos containing materials, or non-friable asbestos containing materials that have become friable prior to the commencement of any demolition activity.[11] In addition, and based on the findings of the risk assessment, the DSC Firmwill also develop a risk management plan to be refined and implemented by works contractors during the construction phase.

2. Construction Phase

107. **Disturbance of land and soil condition.** The construction of innovation centers will only be done in the land allocated by TTIs. There will be no land acquisition and resettlement as these lots are owned by TTIs.

108. Construction phase activities include mobilization of construction equipment, construction of temporary facilities, and construction of innovation centers and other facilities. Prior to the construction of innovation centers, contractors will transport construction materials and equipment that will disturb soil condition within the project area. The impact will be permanent since the area traversed will be used for internal road, parking and buildings. Impacts will be limited to the building footprint area and areas devoted for roads and parking. At the minimum, about 1,900 to 2,500 m^2 of land will be altered permanently since these are the areas required for the building.

109. To mitigate the impacts on disturbance of land and soil condition, best management practices include limiting the amount of erosion and sediment by disturbing only the areas necessary for construction, phasing of construction activity, lessening the grade of steep slopes, and covering of exposed soils until time of revegetation or building of facilities. Soil loss can also be lessened by scheduling construction activities during fair weather to prevent soil erosion, use of appropriate sedimentation and soil erosion and control devices (sediment traps or silt fences). Stockpiles of soil removed during construction should be covered. Storage of construction materials should be limited to paved parking lots or inactive areas within existing building or temporary shed. Construction machineries should be parked in paved areas. Drivers should also be instructed to observe speed limit to reduce soil disturbance.

[11] Friable asbestos material" means any material containing more than one percent (1%) asbestos, as determined using standard polarized light microscopy techniques, which when dry can be crumbled, pulverized, or reduced to powder by hand pressure thereby, releasing airborne fibers. "Non-friable asbestos containing material", on the other hand, means any material containing more than one percent (1%) asbestos, as determined by using standard polarized light micros- copy techniques, which when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure (DENR Administrative Order 2000 – 02).

110. **Generation of wastes.** The rehabilitation of TTIs and construction of innovation centers will generate wastes from cut trees, spoil, demolition and construction wastes that can negatively impact the environment, workers, students and faculty of TTIs, and people close to TTIs. Prior to construction of innovation centers, vegetation will be cut and land will be cleared. These will generate wastes from cut trunks, leaves and roots that may contaminate receiving body of water. Permit to cut trees will be coordinated with DENR CENRO while the disposal of organic materials will be coordinated with the local government.

111. Rehabilitation of TTIs will also generate demolition wastes that may include general wastes and hazardous wastes. The works contractor must implement a waste management plan as part of CEMP, and in case asbestos is identified as being present in those areas of buildings to be demolished or rehabilitated (to be identified during detailed engineering design), the contractor must implement the risk management plan developed by DSC Firm. The contractor must ensure to set-up waste collection area for construction, non-hazardous and domestic solid wastes. Solid wastes must be segregated into biodegradable, recyclable, residual and hazardous wastes. Construction wastes, consisting of concrete and rubble, steel rods, damaged formworks and paper that can be recycled must be separated. Hazardous wastes such as paint, used oil and fuel, and batteries, must be disposed temporarily in designated hazardous waste temporary storage, prior to collection by DENR accredited hazardous waste management provider, for proper treatment, storage and disposal. The contractor will ensure compliance with national regulations, international commitments where Philippines is a party, and WB - IFC EHS Guidelines (2007) on hazardous waste storage, transportation and treatment and disposal. Hazardous wastes generated during construction, which include fuel and chemicals, among others, should be stored to prevent or control accidental releases to air, soil and water resources. Stored waste should have physical separation or containment curbs, and should be stored in closed containers away from direct sunlight, wind and rain. There should be adequate ventilation where volatile wastes are stored.

112. **Impact on air quality and noise level**. There will also be impacts on air quality and increased level of noise arising from movement of construction vehicles, demolition of buildings in some TTIs, and the construction activities itself. The quality of receiving body of water will also be affected, as disturbed land will generate runoff during rainfall events.

113. The movement of vehicles carrying construction materials may generate dust that may affect the air quality in surrounding areas and may also impact the health of the people. The contractor must require covering trucks carrying construction materials to prevent dispersion of dust during transport. Piles of aggregates must also be covered during high wind condition to prevent dust from scattering in TTI vicinity. Washing of tires of construction vehicles will also be imposed after delivery of construction materials. Speed limit and watering of roads will also be implemented to prevent dust.

114. Workers exposed to high noise levels (i.e., 90 dBA) may suffer from physical and psychological stress, reduced productivity, interference with communication and concentration, and may contribute to workplace accidents and injuries due to difficulty in hearing warning signals.[12] Workers who are exposed to repeated exposures to high levels of vibration may suffer from hand-arm and whole-body vibration. Hand-arm vibration exposure, is a known contributing

[12] United States Department of Labor. Occupational Noise Exposure (accessed 13 May 2020).

factor to carpal tunnel syndrome and other ergonomic-related injuries. It also causes direct injury to the fingers and hand that affect feeling, dexterity and grip.[13]

115. To mitigate excessive noise, no worker should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C). The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Impact of vibration can be lessened through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. Electric hazard from exposed or faulty electrical device can be mitigated by such measure as marking all energized electrical devices and lines with warning signs and protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas.

116. **Impact on surface water quality.** The contractor will ensure that the wheels of vehicles transporting aggregates and other construction materials are thoroughly washed to prevent sediment runoff that will impact the quality of receiving body of water. Portable toilets will be provided to manage the wastewater coming from the workers. Contractor through third party service provider, will be responsible for the operation, maintenance and disposal and treatment of collected wastes from portable toilets. Potential impacts on receiving body of water will be addressed through minimization of exposed soil from erosion, construction of silt traps, interceptor drains and sedimentation pits around work areas and camp site.

117. Construction of innovation centers will generate construction wastewater as well as domestic wastewater from workers who will temporarily stay inside workers' camp. It was estimated that around half of workers will stay inside the construction camp. It was estimated that water consumption for each worker is 80 liters/day or a total of 1.92 m^3/day. Sources of water consumption will come from toilets, housing, dining area, laundry and kitchen. It was also estimated that 80%, or 1.5 m^3/day will drain into receiving body of water of each TTI. This volume of wastewater will have high level of BOD_5, nutrients, bacteria and pathogen. This will further contribute to local water pollution if not treated. The impacts on waterways can be mitigated through appropriate collection and treatment.

118. **Impact on vegetation**. As there are trees in some TTIs where innovation centers will be constructed, there will be medium impact on trees as these need to be cut or transplanted in available land within the TTI. A permit to cut will be secured from the CENRO prior to cutting or transplanting of trees. The contractor will schedule the cutting of trees progressively so as not to expose soil for long period. Contractor will be responsible for transport and disposal of biomass wastes from cut trees. Contractor also need to strip the topsoil from any areas to be covered by pavement, structures or where utilities will be located, to be used later for revegetation. Stripping of topsoil shall be at a depth to the bottom of the grassroots zones. Grass shall be stripped together with topsoil.

119. **Impact on water supply**. Since construction will involve the use of water, there will be medium impact on the water supply of TTIs, which is sourced from the community water supply and groundwater supply of TTIs. Water supply will be used for construction activities and for workers' use in construction camp.

[13] R. Brauch. 2015. Vibration Hazards in the Workplace: The Basics of Risk Assessment. *Occupational Health and Safety*.

120. **Impact on vehicle traffic.** There will be increased vehicle movements during construction phase, which may affect localized traffic. There may also be restriction of access in other buildings resulting from the construction of TTI facilities. The contractor will prepare and implement traffic management plan as part of the Contractor's EMP, in coordination with the Traffic Management Office of the city or municipality covering the TTI, to manage the traffic in the area. The plan will include driving policy, roles and responsibilities of drivers, workers and management, traffic management procedures, site layout and traffic flow pattern and schedule, road safety rules, training and vehicle inspection registries, road safety records and incident reports, and performance reports. The contractor must set speed limit for all construction vehicles and install traffic warning signs within the project site. The contractor must also conduct regular orientation and capacity building on safe driving for drivers and workers. Contractor must also be responsible for regular vehicle maintenance. Warning and informatory signs will also be put up along the roads leading to the construction site. There will be prior consultation and coordination with the local governments and affected stakeholders prior to start of construction.

121. **Impact on health and safety.** To minimize the short-term construction impacts on health and safety of workers, students, TESDA personnel, and the community, good construction management practices will be implemented in the select TTIs. The Environmental Management Plan (EMP) for the project, includes mitigation measures to prevent or minimize above construction impacts. The Contractor will also prepare and implement occupational health and safety plan as part of the CEMP, format of which is based from Section 2.0 of World Bank – IFC EHS Guidelineson Occupational Health and Safety.[14] The contractor will implement as well the asbestos risk management plan developed by DSC Firm, as applicable. The project will adhere to the relevantprovisions of the Environmental, Health and Safety General Guidelines of the World Bank Group(2007) and the relevant environmental regulations of the Philippines. The EMP includes mitigation measures on environment (air emissions and ambient air quality, wastewater and ambient waterquality, water conservation, hazardous materials management, waste management and noise); occupational health and safety; community health and safety; and construction and decommissioning. The bidding documents and contracts for civil works will include the EMP.

122. Contractor shall require workers with high exposure to hazards to wear personal protective equipment (PPE) such as face and eye protection device with side shields, welder goggles for welding and hot works, gloves, facemasks with appropriate filters for dust removal, plastic helmets with top and side protection, body suits, and safety shoes and boots. Contractor must also implement fall prevention and protection measures for workers exposed to falling hazard. These include installation of guard rails, proper use of ladders and scaffolds, and use of fall prevention devices such as safety belt. The Contractor should also provide first aid attendant for the project as well as medical kit to treat workers' injuries and illnesses prior to transportation to hospital.

123. The contractor must also restrict the access of students and other personnel of TTIs, and the general public to the site as the construction poses health and safety hazards. These include accidents associated with building structure failure, injuries from falls, open excavation or contact with heavy equipment, respiratory problems from dust and fumes, elevated noise from construction equipment, and exposure to hazardous materials. To lessen the impact of the project on the community's health and safety, the contractor must fence the perimeter of the construction site, install signages, assign guards at entrance and exit, and inform the public through regular

[14] International finance Corporation. Environmental, Health, and Safety (EHS) Guidelines–General EHS Guidelines: Occupational Health and Safety.

consultation. The contractor must also ensure that there are no hazardous conditions inside the project site such as open excavation and unstable piles.

3. Operation Phase

124. **Impact of climate change**. Based on the analysis of climate baseline conditions and future climate change scenario, the project will be affected by El Niño-induced drought and rainfall change.

Table 21: Potential Climate Change Impacts and Proposed Adaptation Measures

Climate Change Indicator	Affected Provinces	Potential Climate Change Impacts	Proposed Adaptation Measures
Niño – induced drought	Sultan Kudarat, Misamis Oriental	Decrease in both community and groundwater supply, affecting the operation of TTIs	Rainwater harvesting measures to supplement existing water supply, specifically in TTIs that depend on ground water supply
		Increase in demand for power supply for air conditioning	Utilize solar PV panels to complement the power supply from the grid. Design incorporating natural ventilation or use of fans instead of air conditioners in some sections of RTICs and rehabilitated TTIs. Possible use of skylight roofing to utilize natural light, and to lessen localized temperature.
		Impact on long-term viability of agri-fisheries related programs of TTIs	Introducing drought tolerant variety of crops, use of water-smart technologies such as drip irrigation and wastewater reuse, and adopting conservation agriculture technologies
Rainfall change	Leyte, Misamis Oriental and Sultan Kudarat, Cagayan	Flooding	Increase in elevation of building above High Flood Level Increase in capacity of drainage Provision of permeable pavement for parking spaces to recharge groundwater supply
Sea level rise	Leyte, Zamboanga del Sur	Flooding, saltwater intrusion, increased level of storm surge	Increase in elevation of building above High Flood Level Developing additional water supply in view of salt water intrusion on groundwater supply Design to minimize impact caused by storm surge

125. **Generation of wastes**. The operation of TTIs and RTICs will generate wastes from students and faculty. The National Solid Waste Management Commission of the DENR estimated that the per capita waste generation for the Philippines is 0.4 kg/day. These include biodegradable from food consumed and papers, recyclables such as bottled water and soft drinks, and wastes generated from TESDA programs (e.g., wastes from metal works, used oil and fuel, batteries, etc.).

126. The Project will abide by the guidelines of Ecological Solid Waste Management Act of 2000 (Republic Act 9003) and the Toxic Substances and Hazardous and Nuclear Wastes Control

Act of 1990 (Republic Act 6969). The former regulates general wastes, while the latter regulates toxic and hazardous wastes.

127. To manage general, non-hazardous wastes, the management must install 3 types of solid waste containers in designated areas with the following labels: biodegradable or organic (food waste, kitchen waste, paper), recyclable (plastics, glasses and metals), and residuals. Alldomestic wastes must be collected, segregated, and transported to common solid waste management facility of each TTI. The collected wastes will be transported through the municipalor city solid wastes management services or through a service provider that will transport the collected solid wastes to materials recovery facility and at the disposal facility of the municipality or city. Hazardous waste management, such as those coming from laboratories, vocational courses related activities, and maintenance activities, will be governed by relevant provisions of RA 6969.

128. Within the project site, each TTI must designate a specific storage zone for hazardous waste. The facility should be lined, with enclosed walls and roofs to store hazardous waste containers. The management should actively promote waste segregation to avoid hazardous waste mixing with general wastes. The management must also initiate regular training on safe practices to handle hazardous wastes. These hazardous wastes include used oil, battery, electric and electronic wastes, pesticides, and paints and other chemicals. Appropriate PPEs will also be required for the workers.

129. **Potential deterioration of water quality**. Wastewater from cleaning of equipment, used oil from vehicles and equipment, kitchen wastes, and other sources may contaminate the receiving body of water of the TTI. To mitigate the potential deterioration of water quality of receiving body of water, each innovation center will install a wastewater treatment system that will meet the effluent standard for water following the Philippine Clean Water Act of 2004 and WB-IFC EHS Guidelines.

130. Additional strain to existing water resource. The operation of innovation center and rehabilitated TTIs will increase additional demand to existing water resource of TTIs. In addition, there will be additional power arising from the usage of additional facilities and equipment. Each TTI will explore options to utilize solar power to complement power from the grid. Each TTI will explore rainwater harvesting for plant irrigation and for general use, except for drinking. Each TTI will also explore the potential of reusing the effluent for flushing toilets, design of which will be finalized in detailed engineering design phase.

E. Analysis of Alternatives

131. Alternative locations for innovation centers were discussed during the February consultations with safeguards focals of each TTI. ADB consultant also consulted with each TTI to discuss the area allocation and the most suitable site for the TTI. The Site Development Plans (**APPENDIX 1)** for the select TTIs are the most suitable locations for each TTI, based on the preliminary evaluation and consultations with the TTI.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Information Disclosure

132. In line with the Access to Information Policy of ADB (2018), the IEE report for the project will be made available in a timely manner, in an accessible place, and in a form and language

that will be understood by affected people and other stakeholders. The purpose is for affected people, including the general public, to provide meaningful inputs into project design and implementation. As this version of the IEE is based on the conceptual design, updated IEE reflecting detailed engineering design, which incorporates further inputs and feedbacks of all concerned stakeholders, will also be made available to the public.

133. ADB will disclose the following safeguard documents on its website: final or updated initial environmental examination upon receipt; and environmental monitoring reports submitted by TESDA during project implementation upon receipt.

B. Key Stakeholder Consultation and Participation to Date

134. ADB's SPS (2009) requires project proponents to carry out meaningful public consultation that begins early and is carried out throughout the project cycle and to provide timely disclosure of relevant information that affected people can understand and can be easily accessed. Moreover, SPS also requires that consultations be free from coercion, be gender inclusive and caters to the needs of disadvantaged and vulnerable people, and that all relevant views of affected people are considered.

135. The consultations aimed to familiarize and build capacity of safeguards focals on ADB's SPS (2009) and the Philippine environmental impact assessment requirements for the TTIs. These consultations also allowed safeguards focals to present the baseline conditions of proposed sites for innovation centers and other facilities. The infrastructure survey and safeguards information that were previously submitted by the TTIs were also discussed to confirm the information indicated in the forms. Lastly, responsibilities on environmental monitoring, establishment of grievance redress mechanism within TTI, and securing of various permits and clearances at each stage of the project from relevant government agencies were also discussed. Below is the program for the consultation.

C. Future Public Consultation and Information Disclosure

136. All key stakeholders should be informed about the project and their inputs solicited. Activities for information disclosure, public consultation and public participation are part of the overall planning design process and construction of the proposed TTIs. Information of planned project activities prior to construction works will be done through stakeholder consultations and publications through mass media and posters. Stakeholder consultations will be done through:

137. **Discussions with stakeholders**. It aim to explain the construction activities of TTIs, including the environmental and social impacts associated with the activities and the management plan to address potential impacts. Stakeholders, which include students, staff of TTIs, and the communities that will be affected by the project, may express their opinions verbally during these discussions.

138. **Survey.** Stakeholders that will be affected by the project will fill out their responses in the questionnaire prepared by TESDA / TTIs. The stakeholders will also provide written opinions and suggestions on the project in the prepared questionnaire as well as their suggestions on managing potential environmental and social impacts of the project.

VII. GRIEVANCE REDRESS MECHANISM

A. Grievance Redress Mechanism

139. ADB's SPS (2009) requires the borrower to establish a GRM to receive and facilitate the resolution of environment-related issues and concerns affecting the project. A project-specific grievance redress mechanism will be established in each TTI, to receive, evaluate and facilitate the complaints / grievances of affected persons on the environmental performance of the established facilities.

140. The PMU will establish and maintain a grievance redress mechanism to register, assess, and address project-related complaints. The selected TTIs will assign GRM focals prior to commencement of works to address the issues raised by affected people on the project. Contact number of the contactor, the TTI safeguards focals, the PMU and the DSC including names, positions, and telephone numbers shall be disclosed at the project site.

141. Persons or groups with project related issues may file their complaints with the GRM focals through the grievance intake form or through email or complaints box that will be made available in each TTI. The TESDA GRM focal at the regional office will be responsible for the registration of grievances and communication with aggrieved party.

142. The steps to be followed in filing complaints and the procedures for redress during construction phase are the following:

(i) Complainant will provide the background and file the complaint verbally or in writing to TTI. The GRM focal will assist the complainant in filling-up the grievanceintake form;
(ii) Within 2 working days, TTI, the contractor's representative, and the complainant will discuss if the complaint can be resolved without calling for a meeting;
(iii) Within 3 days of lodging the complaint, TTI will provide the complainant a written feedback on the process, steps and timeframe for resolving the complaint.
(iv) If the complaint cannot be resolved, a meeting with the complainant will be called within 5 working days;
(v) The TTI will have 15 working days to resolve the complaint;
(vi) The complainant will receive feedback from TTI within 5 working days after the various steps of the GRM are completed; and
(vii) If the complainant is not satisfied with the feedback from the TTI, the complainant will elevate the complaint to TESDA Central Office following the above process. If the complainant is still not satisfied with the outcome, he or she or the group has the option to access the Government's judicial, administrative remedies or through concerned government agencies.

143. The steps to be followed during operation will be the same, except that the contractor's representative will no longer be involved.

144. The GRM focal will receive, follow-up and prepare monthly reports regarding all complaints, disputes or questions received about the Project and corresponding actions taken to resolve the issues. These reports will be included in the semi-annual environmental monitoring reports to be submitted by TESDA to ADB.

B. ADB's Accountability Mechanism

145. In case issues are not resolved through the GRM, affected persons may elevate their complaint to Philippine ADB Resident Mission. The complainant can elevate the case further through the ADB's accountability mechanism in case issues are not resolved through the GRM and ADB Resident Mission. The accountability mechanism provides opportunities for people that are adversely affected by ADB-financed projects to express their grievances, seek solutions, and report alleged violations of ADB's operational policies and procedures, including safeguard policies. ADB's accountability mechanism comprises of (i) consultation led by ADB's special project facilitator to assist people adversely affected by ADB-assisted projects in finding solutions to their concerns and (ii) providing a process through which those affected by projects can file requests for compliance review by ADB's Compliance Review Panel.

VII. ENVIRONMENTAL MANAGEMENT PLAN

A. Overview

146. The EMP has been prepared to provide the mitigating and management measures that will be undertaken for identified impacts at different phases of the project. Information includes: (i) Mitigating measures to be implemented (ii) required monitoring associated with the mitigating measures and (iii) implementation arrangement. Institutional set-up is presented in the implementation arrangement and discusses the monitoring and supervisory roles of responsible parties.

147. The EMP contains a number of components crucial to effective environmental management within the Project. These include:

(i) Evaluate the performance of mitigation measures proposed in IEE;
(ii) Provide information which could be used to verify predicted impacts and thus validate impact prediction techniques;
(iii) Suggest improvement in environmental mitigation measures as required; and
(iv) Provide information on unanticipated adverse impacts or sudden change in impact trends.

148. The EMP has been developed based on discussions with NITESD-TESDA and the online consultations with safeguards focals of the selected TTIs. The EMP will be included in the bid and contract documents to ensure that contractors are aware of their obligations during construction phase. The plan will also guide TESDA in the supervision and monitoring of contractors' safeguards performance during construction.

B. Mitigation Plan

149. Environmental mitigation measures of the project have been formulated and summarized in Table 27. It presents summary information on: (i) project activity causing impacts by project's phase; (ii) Anticipated impacts associated with project activity; (iii) proposed mitigation measures for each environmental impact, (iv) responsible party for carrying out mitigation measures, and (v) associated cost (tentative). Details of mitigating measures are already discussed in Chapter V where the need for mitigation of each impact was determined in the screening process. The table also presents the information on Impact Monitoring including: (i) parameters to be monitored; (ii) frequency and means of verification; (iii) party responsible for monitoring.

150. During the pre-construction phase the cost of preparing tender documents with provisions for the required environmental measures are part of the design consultant's contract. During construction, all costs of environmental mitigation measures shall be the responsibility of contractors and are considered part of their contracts as specified in the technical specifications. During the operation phase, all costs of mitigation measures are part of the operation and maintenance costs of TTIs.

151. The EMP costs shall not be taken as separate environmental costs since they are already part of specific items such as the design consultant's contract, contractors' contracts and TTI's operation and maintenance costs.

C. Reporting

152. Throughout the construction period, each contractor will submit monthly works progress and CEMP implementation reports to the DSC. The quarterly project progress reports prepared by the PMU for ADB should include a short summary of EMP implementation progress and any grievances raised/resolved in the reporting period. The PMC will support the PMU in preparing and submit semi-annual environmental monitoring reports (SAEMRs) to TVET and ADB.[15] The SAEMR will include progress of construction, results of site inspections and environmental monitoring, progress made in EMP implementation, status of compliance with domestic environmental regulatory requirements and other clearances, record of community complaints, unforeseen environmental impacts, and suggested corrective actions for the next monitoring period. The SAEMRs submitted to ADB until the Project Completion Report is prepared. The SAEMR shall be based on the semi-annual environment monitoring reports to be prepared by the TTIs (on behalf of the PIUs). Table below presents the environment safeguards reporting plan for the project.

Table 24: Environmental Safeguards Reporting Plan

Type of Report	Basic Content	Prepared by	Submitted to	Frequency
Construction Phase				
Construction Progress Report	Progress of construction, CEMP implementation (checklists)	Contractors	TTIs, DSC, PMC	Weekly and Monthly
TTI Environment Progress Report	Environment progress reports, including environment supervision results, accidents and	TTIs, DSC	PMU, PMC	Semi-annual

[15] Report template is annexed to the IEE.

Type of Report	Basic Content	Prepared by	Submitted to	Frequency
	incidents, and any complaints received			
Project Progress report	Project status Including a summary section on EMP implementation, accidents and incidents, and any complaints received	PMU, PMC	ADB	Quarterly
Environmental Monitoring Report	EMP implementation, environmental monitoring, compliance with GOI environmental requirements, accidents/incidents, complaints received, and actions undertaken	PMU, PMC	ADB, TVET	Semi-annual
Operational Phase				
Report to ADB	Subproject progress report, including section on EMP implementation and monitoring	PMU, PMC	ADB	Semi-annual until PCR

ADB = Asian Development Bank; CEMP = contractor environmental management plan; EMP = environmental management plan; PCR = project completion report; PIU = project implementation unit; PMC = project management consultant; DSC = design and construction supervision consultant; PMU = project management unit.

D. Institutional Arrangement

153. The Department of Finance is the Executing Agency (EA) and TESDA is the Implementing Agency (IA) for the project. The DOF, who will sign the Loan Agreement on behalf of the Philippine government, will be responsible for overall oversight, strategic and policy direction of the project. TESDA, as the implementing agency, will be responsible for implementing the project. It will be accountable for the use of the ADB loan proceeds and for preparing project financial reports. TESDA will also ensure that the project complies with the ADB SPS, the IEE and EMP, and the PEIS System. The Project Management Unit (PMU) to be established for the project will include safeguard specialists who will be supported by a Project Management Consultant (PMC) and Design and Construction Supervision Consultant (DSC), each with safeguards consultants. Each TTI will assign one safeguards focal for EMP implementation supervision. The PMC, on behalf of the TESDA and the PMU, will update the IEE and EMP during detailed engineering design stage. The tendering process shall advocate environmentally responsible procurement by ensuring the inclusion of EMP provisions in the bidding documents and construction contracts. TTIs are tasked to (i) secure required government environmental approvals such as CNC or ECC prior to project implementation; (ii) establish and operationalize the grievance receipt and administration mechanisms at the TTI level, in line with the overall project level grievance redress mechanism; (iii) conduct consultations with internal and external stakeholders; and (iv) provide inputs to DSC on TTI's compliance to ADB's and Philippine's safeguards requirements for submission to PMU, which, through the PMC, will be responsible for consolidating all the reports from TTIs into one consolidated semi-annual safeguards monitoring report.

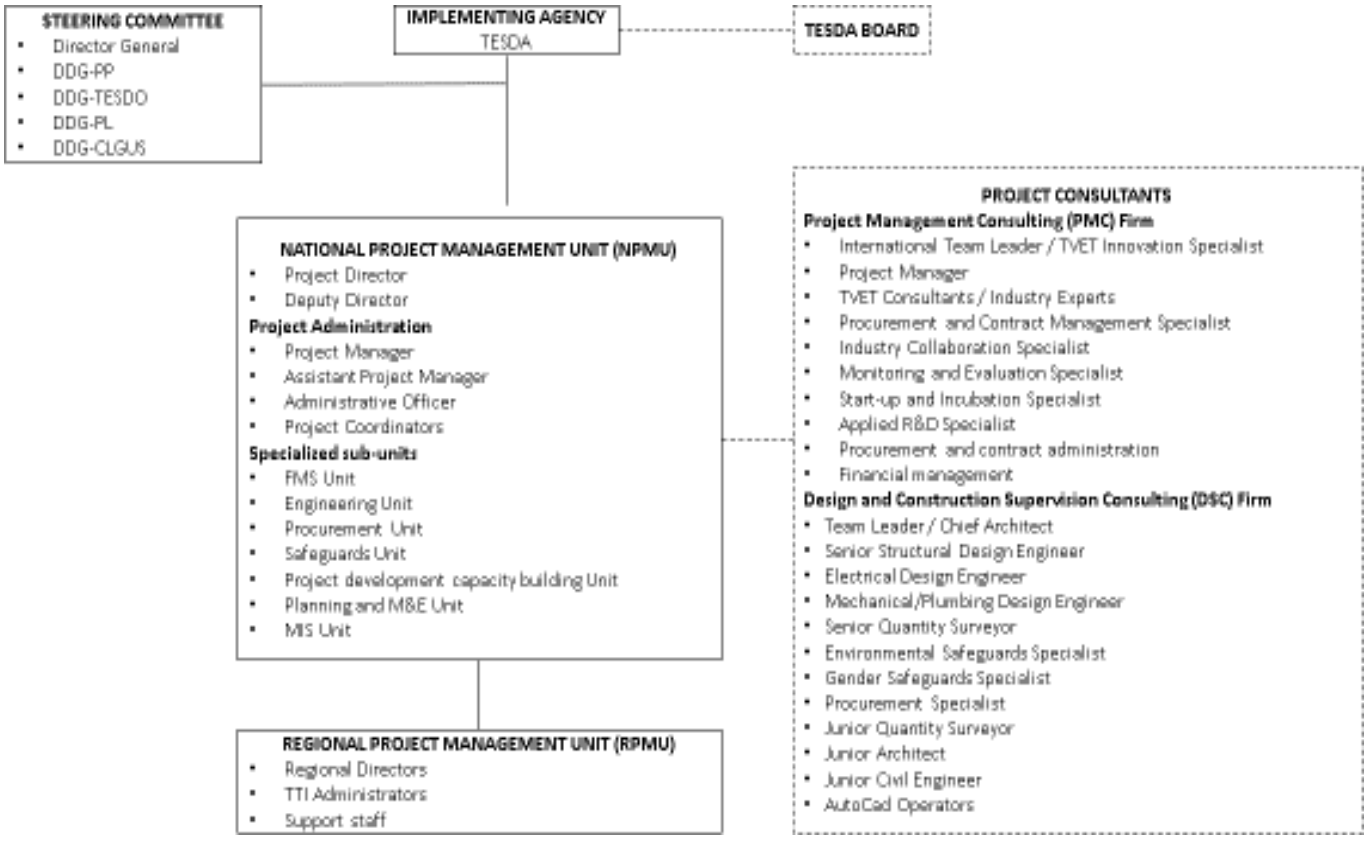
154. Works contractors will assign qualified EHS staff at each construction site to supervise and monitor the EMP and ensure compliance with safeguards requirements of ADB and the

Government of the Philippines. Contractors will be required to prepare and submit their CEMP prior to commencement of works, to be cleared by the DSC.[16]

155. Training and/or workshops on environmental management and monitoring requirements shall be programmed by the PMC for PMU, safeguard focals at TTIs, Contractors and other relevant parties. Monitoring of occupational and community health and safety requirements, including COVID-19 risk management, will be prioritized during construction to reduce risks to workers and the community. PMU and safeguard focals at TTIs shall continue the process of public consultation and information disclosure in accordance with the requirements of the SPS and the government rules and regulations during detailed engineering design and construction phases.

156. The Contractor must adhere to the mitigating measures and other requirements in the EMP to ensure that construction will not adversely affect the environment, the community and workers. During operation phase, each regional TTI will be responsible for implementing environmental management measures specified in the EMP. These include management of wastes from activities arising from the courses to be offered and innovations to be introduced in rehabilitated TTI facilities and innovation centers, respectively. These also include other management measures, as detailed in the EMP of the IEE.

Figure 13: Project Management Organization



[16] The CEMP shall include but not necessarily be limited to the following sub-plans: workers' accommodation plan, occupational health and safety plan, emergency response plan, traffic management plan, waste disposal management plan, and demobilization plan.

Table 25: Institutional Arrangement

Responsible Unit	Roles and Responsibilities
ADB	• Provide financing, monitor implementation and undertake review missions • Approve procurement activities • Review project implementation twice a year • Disburse grant proceeds to the consultants and the contractors for the project
TESDA Board	• Advises the PMO on general policy directions for the project, including ensuring synergy of programs across TVET stakeholder agencies
Steering Committee	• Provides overall direction and oversight function to the PMU; and • Makes decisions on matters critical to the implementation of the project
Project Management Unit (NPMU)	• Responsible for the overall day-to-day operations of the PMO • Liaise with ADB and relevant NGAs and LGUs to ensure compliance with processes and requirements needed in the implementation of the project • Coordinate with relevant NGAs (DTI, DOST, etc.) to ensure project components and outputs are in sync with Philippine development priorities and action plans; • Coordinate with different project stakeholders; • Coordinate / call on other TESDA offices or organizes technical working groups (TWG) to provide or produce administrative, logistical, technical, financial, and other relevant information and data needed for the project; • Ensure compliance with all applicable laws in the implementation of the project; • Provide guidance and ensure seamless communication and coordination between and among the PMU and the Project Consultants; • Undertake project procurement activities (goods, works and consultancy services) in accordance with the Loan Agreement and ADB Procedures; • Handle project financial managements activities in accordance with ADB Procedures; • Facilitate quarterly, special administrative and midterm reviews of the project; • Prepare and submit regular project implementation reports; • Manage contract administration and negotiations requirement; • Provide regular updates to the Oversight Committee and TESDA Board, as needed; • Elevate critical decision points regarding the project to the Oversight Committee
Project Management Consulting (PMC) Firm	The Firm will ensure that the project management, monitoring and support requirements for the project and the delivery of project outputs will be implemented in compliance with the ADB's Policies and Regulations, Loan Agreement, Project Agreement, project administration manual (PAM), procurement plan, and the GOP's national laws.
Design and Construction Supervision Consulting (DSC) Firm	The Firm will work closely with and assist the PMU in the finalization and approvals of all design work needed for the new construction of selected 16 RTICs and the repair and upgrading of selected TTIs. The Firm will be responsible for the timely completion of the detailed architectural and engineering designs (architectural, structural, electrical, mechanical, plumbing designs) for new construction and repair. The Firm will also conduct asbestos risk assessment for the buildings (or parts thereof) to be rehabilitated or demolished, and to develop an asbestos risk management plan should asbestos be identified.
Contractor	Each Contractor will be required to hold a valid Philippine Contractors Accreditation Board license and will appoint a qualified Environment, Health and Safety (EHS) officer to supervise construction works in compliance with the EMP and the Philippine regulatory and policy framework for EHS.

E. Environmental Management Plan

157. The EMP for the project includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates and performance indicators. The Contractor must adhere to the mitigating measures and other requirements in the EMP to ensure that construction will not adversely affect the environment, the community and workers. In addition, the Contractor will prepare the following detailed CEMP:

workers' accommodation plan, occupational health and safety plan, emergency response plan, traffic management plan, waste disposal management plan, and demobilization plan. Key responsibilities for EMP implementation and details of the EMP are detailed below.

Table 26: Key Responsibilities for EMP Implementation

Entity	Key Responsibilities
TESDA	• Ensure that staff of TESDA are aware of and comply with the Government regulations and requirements on environmental management, permits, reporting, and monitoring. • Liaise with DENR to facilitate the securing of ECCs / CNCs. • Comply with the safeguard related provisions with the project Loan Agreement, Project Administration Manual, and Initial Environmental Examination and Environmental Management Plan
Project Management Unit	• Ensure compliance with loan covenants and ADB SPS (2009) • Coordinate with TTI regional offices in the review and approval of the design and contract awards • Ensure that the project design conforms with international standards for TVET • Ensure that the EMP is included in the bid and contract documents with the Contractor • Liaise with the Regional Office to monitor implementation of the EMP by the Contractor • Prepare semi-annual environment monitoring reports on EMP implementation to ADB. • Coordinate the securing of licenses and permits and ensure that Contractors will implement the environmental management plan (EMP) of the project • Provide relevant information on the operation and environmental performance of the existing TTI facilities that includes DENR permits (ECC or CNC and other applicable permits) monitoring reports, and facility layout. • For TTIs that will be rehabilitated, Safeguards Focal of each TTI to complete the Environmental Performance Report and Management Plan (EPRMP) as required in securing the Environmental Compliance Certificate (ECC) amendment from the Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB) regional office • For TTIs not covered by the Philippine EIS System, Safeguards Focal of each TTI to secure Certificate of Non-coverage (CNC) from the DENR-EMB regional office • Ensure the implementation of EMP and reporting of its compliance is being followed by the Contractor • Establish and disseminate the GRM to TESDA regional office and local government, including contact details of authorized person to receive complaints • Address environment-related concerns through the Grievance Redress Mechanism (GRM) set-up for the project
Project Management Consulting Firm	• Support PMU in the project implementation. • Ensure compliance with loan covenants and ADB SPS (2009) • The environment safeguards specialist under the PMC to develop a capacity building program in environmental assessment and management to train and provide capacity support to TESDA, PMU, and Contractors
Design and Construction Supervision Consulting (DSC) Firm	• The Firm will be responsible for the incorporation of the climate resilient design in architectural and engineering designs (architectural, structural, electrical, mechanical, plumbing designs) for new construction and repair • Screening of asbestos risks of facilities to be demolished and rehabilitated and develop asbestos risk management plan • Assign an environment, health and safety officer who will supervise the work of the Contractor in completing the EPRMP / PD as required in securing the ECC amendment / CNC from the DENR-EMB regional office • Ensure compliance with loan covenants and ADB SPS (2009). • Ensure the construction of facilities conforms with the approved building design • Ensure the implementation of EMP and reporting of its compliance is being followed by the Contractor • Review the environment monitoring reports submitted by the Contractor prior to submission to PMU of TESDA
Contractors	• Ensure compliance with relevant design standards for TVET facilities based on the National Building Code, international standards and other related TESDA administrative orders, circulars, and guidelines.

Entity	Key Responsibilities
	• Secure the ECC (or ECC Addendum) or CNC from the concerned DENR-EMB regional office in coordination with the RPMU. • Secure the Building Permit, Sanitary Permit, Electrical Permit, and other clearances from the local government prior to start of construction works. • Implement the asbestos risk management plan developed by DSC Firm • Secure the Fire Safety Evaluation Clearance from the city/municipal Fire Marshal prior to start of construction. • Conduct air, water, and noise monitoring during construction phase. • Prepare the requirements for the requisite permits in close coordination with the TTI. • Assign qualified EHS staff at the construction site to supervise and monitor the EMP • Secure a Fire Safety Inspection Certificate from the city/municipal Fire Marshal. • Secure an Occupancy Permit from the local government • Submit a completion report with as-built drawings to TESDA regional office during turn-over.

ADB = Asian Development Bank, CNC = Certificate of Non-coverage, DENR = Department of Environment and Natural Resources, ECC = environment compliance certificate, EHS = environment, health and safety, EMB = Environmental Management Bureau, EMP = environmental management plan, EPRMP = Environmental Performance Report and Management Plan , GRM = Grievance Redress Mechanism, NPMU = National Project Management Unit, PCO = Pollution Control Officer, PTC = Permit to Construct, RPMU = Regional Project Management Unit, SPS = Safeguard Policy Statement, TESDA = Technical Education and Skills Development Authority, TTI = TESDA technology institutions, TVET = Technical and Vocational Education and Training.
Source: Asian Development Bank.

Table 27: Environmental Management Plan

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
Pre-construction Phase					
Preparation of plans and requirements to secure licenses and permits	Impact on commencement of construction activities	• Obtain all clearances, licenses or permits required for the proposed innovation centers and rehabilitation of TTIs prior to commencing construction in accordance with relevant Philippine government regulations on building structures, environment clearances, and local permits, respectively • Ensure all designs conform with the National BuildingCode of the Philippines • Ensure all licenses and permits have been secured prior to construction work • Prepare the following Contractor's Environmental Management Plan (CEMP): - Workers' accommodation plan - Occupational health and safety plan - Emergency response plan - Traffic management plan - Waste disposal management plan - Demobilization plan	DSC Firm / TTI / Contractor	TESDA / City or Municipal Engineering Offices of LGUs	Operational budget of TESDA
Social Preparation	Community Impact	• Establish Grievance Redress Mechanism • Conduct Traffic Impact Assessment • Capacity building of Safeguards Focal on SPS 2009 and environmental management plan and grievance redress mechanism implementation • Consult with stakeholders	Safeguards Focal of TTI / PMU	TESDA	Operational budget of TESDA
Detailed Design	Impact of climate change and natural hazards on location of innovation center, resources and people	• Incorporation of natural hazard and climate resilient design (e.g., increasing building elevation, increasing drainage capacity, building rainwater harvesting facilities) to minimize impact of natural hazards and climate change • Incorporation of environment-friendly design such as use of natural light, water conservation, solid waste recycling, and energy conservation through use of solar power • Incorporate design that will facilitate easy access for differently abled people in compliance with applicable government regulations	DSC Firm / Contractor	PMC Firm / PMU TESDA	Part of detailed design cost
	Conformity of the project to land use plan	• The innovation centers are within the compound of the TTIs			

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
	Impacts of hazardous wastes from buildings to be demolished	• DSC Firm to thoroughly inspect and assess existing facilities to be demolished or rehabilitated to verify the presence of any friable asbestos containing materials, or non-friable asbestos containing materials that have become friable prior to commencement of any demolition activity. • DSC Firm to prepare asbestos risk management plan, as required.			
	Geologic hazards	• Ensure that the design of the RTIC buildings prone to geologic hazards incorporate resiliency against earthquake, earthquake-induced landslides, and volcanic eruptions			
Flora and fauna survey	Loss of flora and fauna species	• Coordinate with the nearest Community, Environment and Natural Resources Office (CENRO) for RTIC that will be constructed near protected areas and key biodiversity areas to determine appropriate mitigating measures • Secure tree cutting permit from CENRO and implement management measures in the issued Permit to Cut Trees • Schedule cutting of trees progressively so as not to expose soil for long period. • Contractor will be responsible for transport and disposal of biomass wastes from cut trees • Catching of animals will be prohibited • Strip the topsoil at a depth to the bottom of the grassroots zones from any areas to be covered by pavement, structures or where utilities will be located, to be used later for revegetation • Grass shall be stripped together with topsoil, which will be used later for revegetation of RTIC building compound	Safeguards Focal of TTI / Contractor	PMU / TESDA	Operational budget of TESDA
Geologic hazards and climate change assessment	Vulnerability to natural hazards and climate change impacts	• Detailed design will consider hazards from earthquake, tsunami, volcano and flooding • Design properly the drainage system for the project to prevent flooding	DSC / Contractor	PMC Firm / PMU / TESDA	Operational budget of TESDA
Construction Phase					
Mobilization of construction materials and heavy equipment	Disturbance of land and soil condition	• Limit the amount of erosion and sediment by disturbing only the areas necessary for construction, phasing of construction activity • Lessen the grade of steep slopes	Contractor	DSC Firm / PMU / TESDA	Incorporated in environmental mitigations allocation of construction

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
		• Cover exposed soils until time of revegetation or building of innovation centers • Schedule construction activities during fair weather to prevent soil erosion • Use of appropriate sedimentation and soil erosion and control devices (sediment traps or silt fences). • Cover stockpiles of soil removed during construction • Limit storage of construction materials to paved parking lots or inactive areas within existing building or temporary shed • Park construction machineries in paved areas • Drivers to observe speed limit to reduce soil disturbance			contract (contract of civil works)
	Impact on surface water quality	• Ensure that the wheels of vehicles transporting aggregates and other materials are thoroughly washed to prevent sediment runoff going to nearest body of water • Provide portable toilets to manage wastewater from workers who stays in construction camp • Contractor through third party service provider or through coordination with local government unit, will be responsible for the operation, maintenance and disposal and treatment of collected wastes from portable toilets • Segregate and pre-treat oil and grease containing effluent using grease trap prior to discharge • Minimize erosion from exposed soil, construct silt traps, interceptor drains and sedimentation pits around work areas and camp site • Clean construction vehicles within paved surfaces to lessen contamination of soil and groundwater • The contractor will be responsible for compliance with DENR's Clean Water Act and WB – IFC EHS Guidelines on wastewater discharge standard.	Contractor	DSC Firm / PMU / TESDA	Incorporated in environmental mitigations allocation of construction contract (contract of civil works)
	Impact from generation of solid wastes and hazardous wastes.	General non-hazardous wastes: • Contractor must implement a waste management plan as part of Contractor's Environmental Management Plan (CEMP) • Ensure to put up waste collection points for construction, hazardous, non- hazardous and domestic solid wastes • Install garbage receptacles at worker camp and construction area	Contractor / Approved service provider	DSC Firm / PMU TESDA	Incorporated in environmental mitigations allocation of construction contract (contract of civil works)

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
		• Coordinate with local government unit or private contractor for the collection, treatment and disposal of wastes • Coordinate with local government units where TTIs are located for the management of wastes • Segregate solid wastes into biodegradable, recyclable, residual and hazardous wastes • Separate construction wastes (consisting of concrete and rubble, steel rods, damaged formworks, paper) that can be recycled • The contractor will be responsible for compliance with the Ecological Solid Waste Management Act of 2000 and WB – IFC EHS Guidelines on waste management Hazardous wastes • Ensure compliance with Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 and WB - IFC Environment, Health and Safety Guidelines (2007) on hazardous waste storage, transportation and treatment and disposal • For asbestos, works contractor to implement asbestos risk management plan developed by DSC Firm. These shall be implemented by qualified experts only. • Store hazardous wastes generated during construction of innovation centers and rehabilitation of TTIs, which include fuel and chemicals, among others, to prevent or control accidental releases to air, soil and water resources • Physical separation or use closed containers for hazardous wastes, away from direct sunlight, wind and rain. • Provide adequate ventilation where volatile wastes are stored • Conduct on-site and off-site transportation of waste to prevent or minimize spills, releases, and exposures to workers and the public • In case of third-party hazardous waste transporter, employees involved in the transportation of hazardous materials should be trained regarding proper shipping procedures and emergency procedures			

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
	Increase in the level of air pollutants and noise	• Ensure that the wheels of vehicles transporting aggregates and other materials are thoroughly washed • Cover material piles during high wind condition • Impose speed limit within the TTI compound to lessen disturbance of soil • Ensure that contractors' vehicles meet the regulatory requirement on air quality • Water exposed soil to prevent suspension of particulate matter • Cover construction materials to prevent erosion and dispersion of materials • Apply water to minimize dust from vehicle movements • Train drivers on good driving practices, including driving within safe speed limits and measured acceleration to prevent to lessen dust • Ensure that all air emission licenses and permits of construction machineries and equipment are updated • Implement a regular vehicle maintenance and repair program. The Contractor will ensure to comply with Philippine Clean Air Act or WB – IFC EHS Guidelines 2007 on air quality standards, whichever is stricter • Comply with the Environmental Quality Standards for Noise in General Areas (National Pollution Control Commission, 1980) or WB – IFC EHS Guideline on Noise. • Monitor air quality standards and noise, together with other parameters, quarterly, to ensure compliance • Contain the pollutants by fencing off the construction site • Require exposed workers to wear appropriate personal protective equipment (PPE) such as masks and goggles • For workers exposed to excessive noise, wear hearing protection and for a limited exposure time only • Implement timing of operation that avoids sensitive hours, shielding of noise sources, and proper maintenance and operation of equipment • Restrict work between 8:00 AM and 5:00 PM • Schedule classes and activities in TTI buildings not directly affected by the construction activities in the innovation centers • Prohibit workers from open burning of wastes.	Contractor / Approved service provider	DSC Firm / PMU / TESDA	Incorporated in environmental mitigations allocation of construction contract (contract of civil works)

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
	Impacts from transportation of construction materials and wastes	• Prepare and implement traffic management plan as part of the Contractor's EMP, in coordination with the Traffic Management Office of the local government unit where TTI is located, to manage the traffic in the area • Traffic management plan to include driving policy, roles and responsibilities of drivers, workers and management, traffic management procedures, site layout and traffic flow pattern and schedule, road safety rules, training and vehicle inspection registries, road safety records and incident reports, and performance reports • Set speed limit for all construction vehicles and install traffic warning signs within the project site • Conduct regular orientation and capacity building on safe driving for drivers and workers • Regular vehicle maintenance and use of genuine parts to prevent malfunction that may lead to accident • Put up warning and informatory signs along the routes of construction vehicles • Prior coordination with the affected stakeholders, specifically with barangays where construction vehicles will pass through, prior to commencement of construction.	Contractor	DSC Firm / PMU / TESDA	Incorporated in environmental mitigations allocation of construction contract (contract of civil works)
Hiring and mobilization of workers	Occupational health and safety of workers	• Prepare and implement occupational health and safety plan as part of the CEMP. Such plan shall also include a COVID-19 risk management protocol to address COVID-19 risks to workers and nearby community. • Avoid forced labor and child labor (Contractor, subcontractors, and supply chain) as per ADB's SPS, 2009 and Philippine law • Inform workers regarding access to Grievances Redress Mechanisms (GRM) • No worker should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection • No unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C) • Lessen impact of vibration through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. • Require workers with high exposure to hazards to wear personal protective equipment (PPE) such as face and eye protection device with side shields, welder goggles for	Contractor	DSC Firm / PMU / TESDA	Incorporated in environmental mitigations allocation of construction contract (contract of civil works)

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
		welding and hot works, gloves, facemasks with appropriate filters for dust removal, plastic helmets with top and side protection, body suits, and safety shoes and boots • Implement fall prevention and protection measures for workers exposed to falling hazard • Install guard rails, proper use of ladders and scaffolds, and use of fall prevention devices such as safety belt • Provide first aid attendant for the project as well as medical kit to treat workers' injuries and illnesses prior to transportation to hospital. • Train workers in the use of MSDS of chemicals used in the construction site, safe work practices, and appropriate use of PPE to mitigate exposure from chemical hazards • Implement the asbestos risk management plan developed by DSC Firm. Only workers with necessary qualifications and experience shall implement the plan. • Store flammables away from entry and exit points of buildings, and storage area should have natural floor and ceiling level ventilation • Install fire extinguishers in workers' camp and in construction site • Ensure and enforce hygiene among workers and to allow sick workers not to continue working in the construction site • Observe COVID 19 health protocols as mandated by the Inter-agency Task Force on COVID 19 and the Department of Health • Breeding grounds of vectors such as mosquitoes should be kept free from stagnant water • Ensure cleanliness to keep away pests • Provide emergency and health services on site to address worker's injury and illness, including access to ambulance and medical services from nearby hospitals			
	Community health and safety	• Fence the perimeter of the construction site, install signages, assign guards at entrance and exit, and inform the stakeholders (internal and external) through regular consultations • Ensure that there are no hazardous conditions inside the project site such as open excavation and unstable piles. • Prioritize and promote traffic safety during construction phase when project equipment and machineries were utilized that may impact the safety and health of the public	Contractor	DSC Firm / PMU / TESDA	Incorporated in environmental mitigations allocation of construction contract (contract of civil works)

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
		• Hire professional licensed drivers and train them on safe driving • Limit the duration of trips to avoid overtiredness • Maintain vehicles regularly • Cover trucks carrying construction materials to prevent dispersion of dust during transport • Prepare and implement emergency response plan health as part of the CEMP to primarily assist staff and emergency response teams during real life emergency that may also affect the community			
Operation Phase					
Operation of innovation center	Management of solid wastes,	• Engage solid waste management service to manage the cleaning of facilities, and collection of wastes • All domestic wastes must be collected, segregated, and transported to common solid waste management facility • Transport collected wastes will by a licensed collection / treatment company to materials recovery facility and finally, at the disposal facility	TTI	TESDA	Yearly maintenance cost of building including fire protection and waste management is estimated 2% of the total building cost. The budged to be included in operations and maintenance budget of the TTI
	Management of wastewater	• Install a wastewater treatment system that will meet the effluent standard of Clean Water Act and WB-IFC EHS Guidelines • Monitor effluent standard for water following Clean Water Act and WB-IFC EHS Guidelines	TTI	TESDA	
	Traffic Management	• Coordinate with the Traffic Management Office of the local government unit where TTI is located, to manage the traffic within the vicinity of TTI • Orient drivers on driving policy and road safety rules • Install traffic management signs inside TTI such as speed limit, pedestrian crossing and parking spaces	TTI	TESDA	
	Occupational health and safety	• Prepare and implement occupational health and safety plan for innovation center • Adopt COVIID-19 protocols as provided by the Department of Health and Inter-agency Task Force for the Management of Emerging Infectious Diseases • Inform workers regarding access to Grievances Redress Mechanisms (GRM) • Require students who are exposed to hazardous course-related activities to wear appropriate PPE such as face and eye protection device with side shields, welder goggles for	TTI	TESDA	

Project Activities	Environmental Impacts	Mitigation Measures	Responsibility		Budget Source
			Implementation	Monitoring	
		welding and hot works, gloves, and facemasks with appropriate filters for dust removal • Provide first aid kit to treat minor injuries and illnesses • Install fire extinguishers in designated sites			

Table 28. Environmental Monitoring Plan

Environmental Indicators	Parameters	Location	Methodology	Frequency	Standard	Responsibility		Budget Source
						Implementation	Monitoring	
General impact	Licenses and permits, social preparation, detailed engineering design	TTI in 17 regions	Fieldwork, community consultation, consultant to prepare detailed engineering design, coordination with utility companies	Once, prior to construction phase		DSC Firm / TTI / Contractor	PMU	Operational budget of TESDA
Flora and fauna	Species, volume of yard wastes generated	TTI in 17 regions	Survey and marking of affected trees	Once, prior to construction phase		TTI	PMU / CENRO	Operational budget of TESDA
Air quality	SO_2 (1 hour) CO (1 hour) NO_2 (1 hour) $PM_{2.5}$ (24 hours) TSP (24 hours)	TTI in 17 regions	Field works with analysis approved by DENR	Semi-annual during construction	Philippine Clean Air Act of 1999	DSC	PMU / EMB - DENR	DSC budget
Noise level	Average dB(A)	TTI in 17 regions	Field works with analysis approved by DENR	Semi-annual during construction	World Bank – IFC EHS Guidelines	DSC	RPMU / EMB - DENR	DSC budget
Surface water quality	pH, temperature, color, BOD_5, DO, oil and grease, TSS, nitrate, phosphate, ammonia, surfactant (MBAS), fecal coliform, total coliform	Receiving body of water of TTI in 17 regions	Field works with analysis approved by DENR	Semi-annual during construction	Philippine Clean Water Act of 2004 / DENR Administrative Order No. 08, series of 2016 (Water Quality Guidelines and General Effluent	DSC	RPMU / EMB - DENR	DSC budget

Environmental Indicators	Parameters	Location	Methodology	Frequency	Standard	Responsibility		Budget Source
						Implementation	Monitoring	
					Standards of 2016)			
Wastewater quality	pH, temperature, color, BOD_5, DO, oil and grease, TSS, nitrate, phosphate, ammonia, surfactant (MBAS), fecal coliform, total coliform	Construction site and workers camp	Field works with analysis approved by DENR	Semi-annual during construction	Philippine Clean Water Act of 2004 / DENR Administrative Order No. 08, series of 2016 (Water Quality Guidelines and General Effluent Standards of 2016)	DSC	RPMU / EMB - DENR	DSC budget
Solid waste	Domestic waste segregated, collected and disposed in disposal site; Hazardous waste collected, transported and treated in accredited facility	Location of demolished buildings; Construction site and workers camp	Screening for hazardous wastes and asbestos; Visual observation	Prior to construction phase for hazardous wastes; Monthly	Republic Act 6969; DENR Administrative Order 2000 – 02 for asbestos; Ecological Solid Waste Management Act of 2000	Contractor	DSC	DSC Budget
Occupational health and safety	Space allocated per person, supply of safe water, adequate sewage and garbage disposal system, accommodation, sanitary and washing facilities, ventilation, provision for cooking, and storage facilities	Workers' camp	Observation	Daily	Republic Act 11058 (Occupational Safety and Health Standards)	Contractor	DSC	DSC Budget
	Near misses, incidents, or accidents resulting in injuries and emergency response	Workers' camp	Observation	Daily	Republic Act 11058 (Occupational Safety and Health Standards)	Contractor	DSC	DSC Budget

Environmental Indicators	Parameters	Location	Methodology	Frequency	Standard	Responsibility		Budget Source
						Implementation	Monitoring	
	Dust mitigation, noise and vibration levels, stagnant water	Workers' camp	Observation	Daily	Republic Act 11058 (Occupational Safety and Health Standards)	Contractor	DSC	DSC Budget
Community health and safety	Access to the site and dangerous conditions - fencing the perimeter of the construction site, installation of signages, assigning guards at entrance and exit, and informing public through consultation No hazardous conditions - open excavation and unstable piles Traffic incidents and accidents	Construction site	Observation	Daily	World Bank – IFC EHS Guidelines	Contractor	DSC	DSC Budget
Operation Phase								
Solid waste	Domestic waste segregated, collected and disposed in disposal site; Hazardous waste, including infectious wastes collected, transported and treated in accredited facility	TTI in 17 regions	Observation	Annual	Republic Act 6969; Ecological Solid Waste Management Act of 2000	TTI	EMB - DENR	TESDA budget
Wastewater quality	pH, temperature, color, BOD_5, DO, oil and grease, TSS, nitrate, phosphate, ammonia, surfactant	TTI in 17 regions	Field works with analysis approved by DENR	Annual	Philippine Clean Water Act of 2004 / DENR Administrative Order No. 08,	TTI	EMB - DENR	TESDA budget

Environmental Indicators	Parameters	Location	Methodology	Frequency	Standard	Responsibility		Budget Source
						Implementation	Monitoring	
	(MBAS), fecal coliform, total coliform				series of 2016 (Water Quality Guidelines and General Effluent Standards of 2016)			
Traffic	Traffic incidents and accidents	TTI in 17 regions	Observation	Annual	Republic Act 4136 (Land Transportation and Traffic Code)	TTI	DOTR / Local Government Unit	LGU budget
Occupational health and safety	Space allocated per person, supply of safe water, adequate sewage and garbage disposal system, sanitary facilities, lighting and ventilation	TTI in 17 regions	Observation	Annual	Republic Act 11058 (Occupational Safety and Health Standards)	TTI	TESDA	TESDA budget

VIII. CONCLUSION AND RECOMMENDATION

158. The results of the initial evaluation for the rehabilitation of TTIs and construction of innovation centers in the 17 regions, show that based on the preliminary design, location and environmental conditions, the anticipated environmental impacts will be primarily related to geologic hazards, natural hazards, flooding risks, climate change impacts and impacts on biodiversity and loss of trees. Construction phase impacts are considered typical for similar buildings, and mainly involved disturbance of land and soil condition, generation of wastes from rehabilitated TTIs and construction of innovation centers, and impact on air quality and noise level, surface water quality, loss of vegetation, reduced water supply from ground water, temporary disturbance of access, increased level of use of water, increased level of vehicle traffic,and health and safety of workers and the community. During operation, major impacts include climate change while medium for generation of solid wastes from TVET activities, potential deterioration of water quality, additional strain to existing water resource, traffic generation, increase in level of particulate matter, deterioration of water quality, reduced water supply from groundwater, and risks of students and workers from handling equipment.

159. Mitigating measures were proposed and incorporated in the environmental management plan to lessen the identified risks. Stakeholders from TESDA were favorable of the project since the expected benefits far outweighed the anticipated impacts. Overall, the project is expected to bring beneficial impacts to TTIs in the 17 regions on a wider scale in terms of enhancing the quality of vocational education in the Philippines.

Region II – Cagayan

Project Site Info: **Size of Lot Available** 1,390.00 sqm Approx.	

.

APPENDIX 3: **FLOOD HAZARDS**

Figure 3. Regional Training Center Tuguegarao - 5-year flood hazards (low to medium, <0.5 m to 1.5m)

APPENDIX 4: PROTECTED AREAS AND KEY BIODIVERSITY AREAS NEAR THE SELECT TTIs USING INTEGRATED BIODIVERSITY ASSESSMENT TOOL (IBAT)

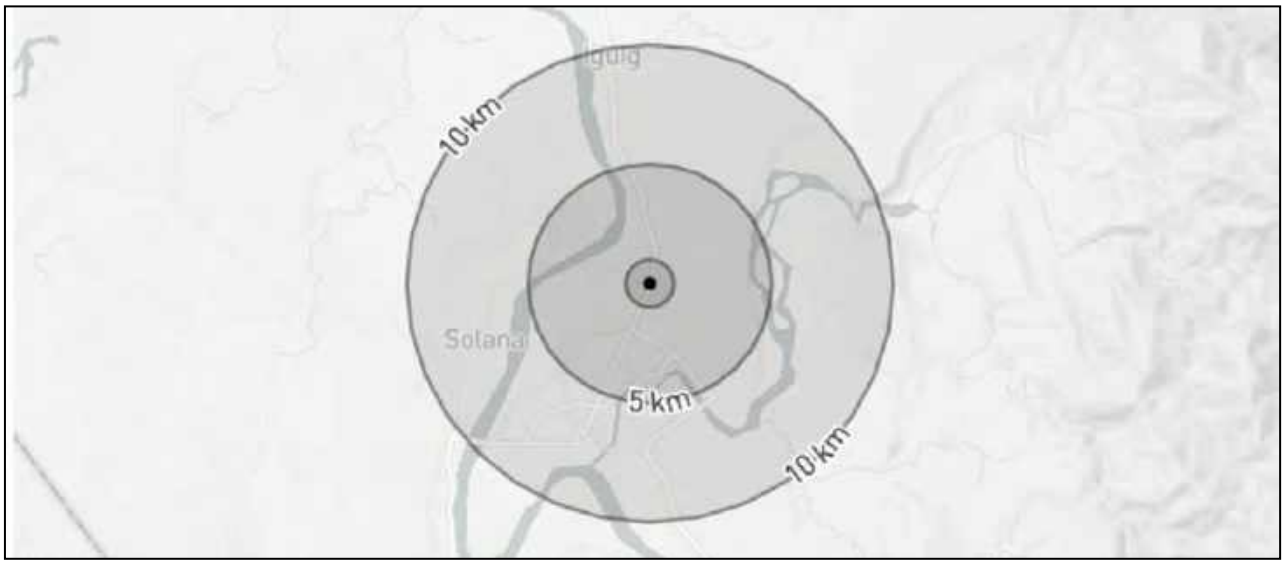


Figure 2. Regional Training Center – Tuguegarao

Annex G

Republic of the Philippines
TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
ISO 9001: 2015 Certified

Project: Regional TVET Innovation Center (RTIC) for Northern Mindanao School of Fisheries (NMSF)
Name of Support Facility: Northern Mindanao School of Fisheries (NMSF)
Address: Buenavista, Agusan del Norte

Item No.	Picture Taken	Location	Description	Quantity	Unit	Program of Work to be done
1		**Aquaculture Center Building**	Painting of the sstructure Dimension: 28m x 12m x 3.2m	512.00	sq.m	• Painting works • Peel-off/ repainting of all ceiling and walls (interior and exterior)
2		**Aquaculture Center Building**	Replacement of the ceiling materials Dimension: 28m x 12m	336.00	sq.m	• Replacement of dilapidated ceiling into new ceiling material (metal furring and PVC ceiling and others)
3		**Aquaculture Center Building (Inside)**	Electrical Wiring Sytem	1.00	lot	• Rewiring/ replacement of: Lighting-60 LED tube; 2 sets emergency light convenience outlet 3-gangs - 20pcs swutches 1-gangs - 10pcs 2gang - 8pcs; 3gangs - 8pcs Breaker (125 ampere) - 2pcs; Breaker (100 ampere) - 8pcs; Breaker (40 ampere) - 2pcs; Breaker (300 ampere) - 1pc; Breaker (30 ampere) - 13pcs; Breaker (20 ampere) - 7pcs; Breaker (15 ampere)) - 3pcs Panel Board - 3phase, MCCB - 20branches-3pcs wire & cables - 8.0mm2THHN - 5.0meters 3.5mm2THHN - 10.0meters; 2.0mm2THHN - 15.0meters; 14.0mm2THHN - 14.0meters Utility Box - 67pcs; Junction Box - 225pcs 15.0mm2 PVC Connector - 260pcs; 25.0mm2 Connector - 70pcs; 63.0mm2 PVC Connector - 2pcs • Fire Alarm, Smoke Detector, CCTV set, Fire Sprinkler System, Electrical Wirings, Fittings and Devices
4		**Aquaculture Center Building (Inside)**	Repair and rehabilittaion of Research/ Quality Control Room & Storage Facilities & Instructional Room Dimension: 12.0m x 5.0m	60.00	sq.m	• Repair/ replacement of floor tiles • Repair/ re-installation of water system
5		**Aquaculture Center Building**	Electrical Transformer	3.00	units	• Replacement of 3-units of Transformer 50KVA, Wirings, Fittings and Electrical Devices
6		**Fresh Hatchery Building**	Roofing 30m x 15m	450.00	sq.m	• Replacement of roofing materials colored roof rib type 5mm thk with 10mm double sided insulated, trusses, purlins, gutter, flashing, demolished and others
7		**Fresh Hatchery Building**	Painitng: 30m x 15m	306.00	sq.m	• Re-painting of post beam, tank, grow out tank, storage tank, perimeter fence made of cyclone, and metal parts trusses, purlins and others

8		**Fresh Hatchery Building**	Floor tiles 30m x 15m	450.00	sq.m	• Installation of floor tiles usisng 60cm x 60cm porcelain finish tiles
9		**Fresh Hatchery Building**	Old fence cyclone wire materials	90.00	lm	• Demolished existiing cyclone wire • Replacement of perimeter 60lm fiber glass and portion of 30lm, aquarium glass with frame 1.5m x 0.60m x a total of 90lm.
10		**Fresh Hatchery Building**	Plumbing System	1.00	lot	• Repair and replacemnt of PVC pipe, gate valve, faucet, grow out tank, water connection, storage tank motor, aerator pipe line system, motor compressor, submersible water pump, valves, fittings and pipe connection, sprinkler system, drainage system and others
11		**Fresh Hatchery Building**	Concrete Tanks	52.00	units	• Repair of concrete tanks (plastering, finishing, painting and sealant application)
12		**Fresh Hatchery Building**	Electrical Wiring System	1.00	lot	• Re-wiring and replacement of lighting, outlet, switch, breaker and panel board 3 box stranded wire #8, #10, #12, #14, 30pcs LED bulb 20watts; 30pcs receptacle #4; 85pcs junction box; 150m flexible hose #12; 100m flexible hose #3/4; 20pcs electrical tape big; 6sets magnetic switch; 50set plastic moulding #1; utility box surface type; 12set 3 gang switch flush type; 15sets 3 gang with outlet; 2pcs circuit breaker 15amps, 3pcs circuit breaker 30amps,; 1pc circuit breaker 60amps, fire alarm, smoke detector, CCTV set, and others
13		**30 meters from Fresh Hatchery Building (source of water for reshwater hatchery)**	Old Cistern Tank not Functional	1.00	lot	• Installation of Water System Level II with cistern, drilling, elevated concrete reservoir, distribution pipelines, tap stan, motor pump, submersible pum, valves, fitting
14		**Marine Water Hatchery Building**	Roofing Dimesion: 8m x 9m	72.00	sq.m	• Re-roofing with double sided aluminum insulations foams • Rib roof type. 5mm thk. X 1 effective width, ridge roll, hip gutter & coever gutter
15		**Marine Water Hatchery Building**	Trusses and Purlins	72.00	sq.m	• Replacement of double-sided trusses angle bar 2" x 2" x 1/4" x 6m with paint • Replacement of purlins 2" x 4" x 1.3mm x 6m with paint
16		**Marine Water Hatchery Building,**	Perimeter Fence within the building	30.00	lm	• Installation of perimeter fence within the building, CHB 4" x 8" x 16", plastering double sided, finishing, 40cm height x 30ln,m (floor area: 7m x 8m) • Replacement of worn cyclone wire into a new material (cyclone wire, 4.2mm wire diameter) with G.I. pipe frame 2dia. angle bar 3/4" x 3mm thk., height 4ft.

17		**Marine Water Hatchery Building,**	Perimeter Fence Outside the Structure	62.00	lm	• Replacement of perimeter fence from waste corrugated materials into concrete hollow blocks (CHB) 6" x 8" x 19" • Plastering of double wall, concrete post, with height of 1.6m with painted steel double door dated
18		**Marine Water Hatchery Building,**	Watchman's Quarter	50.00	sq.m	• Replacement of old wooden structure into new and concrte structure (elevated type)
19		**Marine Water Hatchery Building,**	Electrical Wiring System	56.00	sq.m	• Installation of nnew panel board, circuit breaker, oulet, lighting, electrical fittings and repair, electrical upgrading & others • Installation of smoke detector and fire alarm
20		**Marine Water Hatchery Building,**	Water System going to Larval and BMT Tank	1.00	lot	• Replacement and installation of new pipes with 2units of Larval Tank and 2 units of BMT Tank made of concrete with the dimension of 2.5m x 1.5m, 5HP water pump, pipe aerator piper line going to each tank, 2HP Air Compressor, fittings and accessories and storage tank
21		**Marine Water Hatchery Building,**	Water Sytem from Water District	1.00	lot	• Installation of water system from water district with meter device, 1 unit of waetr metering, 3/4" dia. black hose and 1/2" dia. PPR Pipes and fittings, fixture and fittings
22		**Marine Water Hatchery Building,**	For concrete pouring	102.00	sq.m	• Rehabilitation of building structure for concrete pouring, retouching and finishing: post, beam, header, concrete canal and concrete tank, 8m x 9m floor slab 3"
23		**Marine Water Hatchery Building**	Comfort Room	8.75	sq.m	• Rehabilitation of 2 units of comfort room and installation of septic tank • 2 units flush bowl, round type with lavatory and other toilet fixture. • Concrette plastering, finishing with installation of wall tiles of 30cm x 30 cm, floor tiles of 30cm x 30cm • Installation of corrugated roof with flashing and gutter.
24		**Food Processing, Bread & Pastry Processing, Institutional Room**	Roofing Dimesion: 60m x 12m	720.00	sq.m	• Replacement of roofing materials colored rib type roof
25		**Food Processing Building**	Dilapidated Ceiling	416.00	sq.m	• Replacement of dilapidated ceiling into new ceiling material: metal furring and PVC
26		**Food Processing Building**	Re-painting	563.20	sq.m	• Painting works • Repainting of interior and exterior walls, ceiling partition and comfort rooms

27		**Food Processing Building**	Comfort Room	1.00	unit	• Installation of new 1-unit of comfort • Installation of floor and wall tiles • Installation of plumbing system, PVC door, electrical system and exhaust fan

ANNEX H - PROJECT INFORMATION SIGNAGE REQUIREMENTS

1. The Contractor is responsible for the design, supply, and installation of the project information signage. The signage shall provide relevant information to the public about the project, including the proper designation of the project, the Employer, the Contractor, and the Bank.

2. For this purpose, one or several sign boards shall be installed at the Site as soon as practicable after the Commencement Date and shall remain in place at all times until taking-over of the Works. If sign board(s) is(are) damaged or become(s) unreadable during this period, it shall be promptly replaced by the Contractor at the Contractor's cost.

3. The sign board design shall be submitted by the Contractor to the Project Manager for Review. No physical Works shall commence on Site until the Project Manager has given (or is deemed to have given) a Notice of No-objection to the sign board design and until the sign board(s) have been properly installed in the agreedupon location(s) at the Site. Unless otherwise required under the applicable Laws, the sign board design should comply with the following:

   (a) General

   - The number and locations of sign board(s)

   (b) Content

   - Borrowing country flag/logo
   - Project and Contract title
   - Accepted Contract Amount
   - Time for Completion
   - ADB Logo (in accordance with Branding Tool Kit – Visual identity guidelines of the Asian Development Bank)
   - Employer's name
   - Contractor's name
   - Engineer's name
   - Complaint handling contact information (email and/ or phone number)

   (c) Design

- The General layout including sample colors: to be proposed by the Contractor

- Dimesions: minimum of 2.5 Meters X 2.5 Meters.

- Font size and type: they should be such as to ensure that the content shall be visible from a distance.

- The language of the signage – national/ local language and English.

- Material: the sign board(s) shall be made of a material that shall be weatherproof and appropriate to withstand the whole execution period until taking-over of the Works

4. No other signage is allowed except with the approval of the Engineer. The Contractor shall not post nor display any sign or item that could provide misleading information about the project. No national symbols or flags other than those of the Country may be displayed without the express approval of the Engineer.

Project Signage Logo Guidelines

ADB

WHEN TO USE THE ADB LOGO WITH WORDMARK

Use the ADB logo with a wordmark for project sites fully funded by ADB only.

Example application - horizontal (Hoarding, banner mesh, fence wrap):

Fully funded

Example application - vertical (Signboard):

Fully funded

WHEN TO USE THE ADB LOGO WITHOUT WORDMARK

Use the ADB logo without a wordmark for project sites jointly funded by ADB and other project financiers and donors.

Example application (Hoarding, banner mesh, fence wrap):

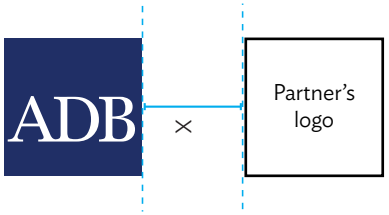
Jointly funded

Example application - vertical (Signboard):

Jointly funded

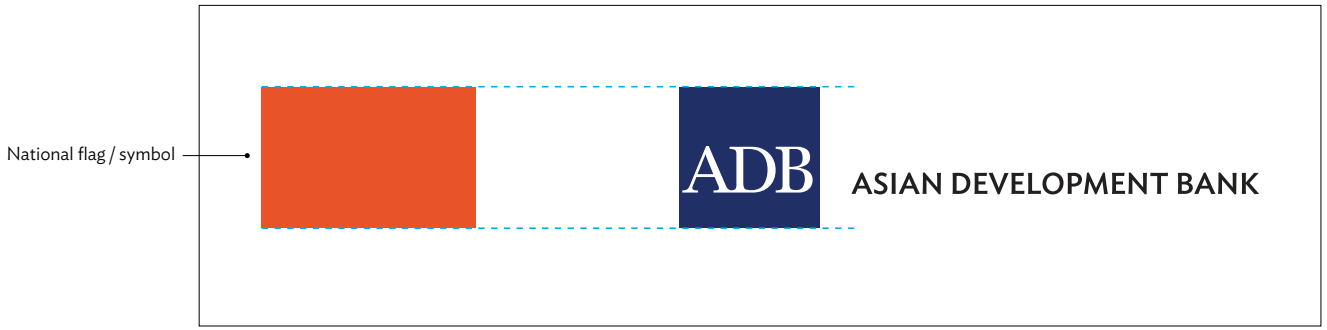
ADB logo clear space for jointly funded

The minimum distance to be maintained in between the ADB logo and partner's logo is: X = the height between the baseline of the type and the top of the square.



ADB LOGO SIZE

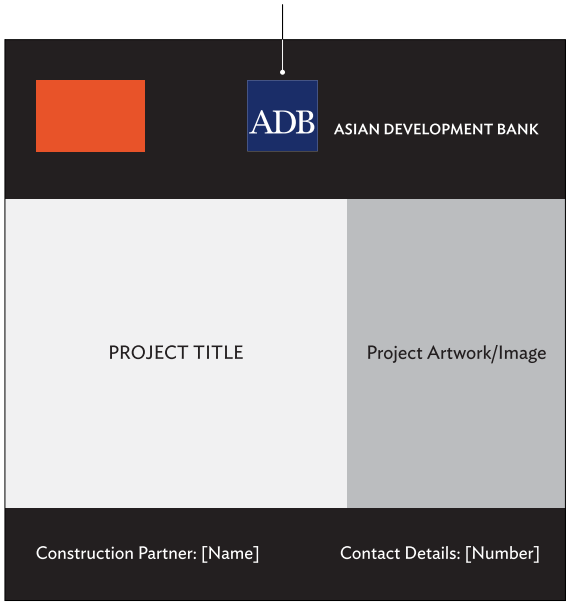
The height of the ADB logo should be equal with the height of the national flag / symbol.



ADB LOGO FOR WHITE AND DARK BACKGROUND

Use the standard ADB logo for white background.

Use the ADB logo w/ outline for dark background.



DOWNLOAD ADB LOGO FILES

ADB LOGO WITH WORDMARK

For white background

ADB ASIAN DEVELOPMENT BANK	DOWNLOAD LINK: https://bit.ly/ADBLogowithWordmarkforWhiteBackground

For dark background (ADB logo with outline)

ADB ASIAN DEVELOPMENT BANK	DOWNLOAD LINK: https://bit.ly/ADBLogowithWordmarkforDarkBackground

ADB LOGO WITHOUT WORDMARK

For white background

ADB	DOWNLOAD LINK: https://bit.ly/ADBLogowithoutWordmarkforWhiteBackground

For dark background (ADB logo with outline)

ADB	DOWNLOAD LINK: https://bit.ly/ADBLogowithoutWordmarkforDarkBackground