Public Private Partnership Support Facility

Risk Management Report

For the Period Ended Jan 2025 to Mar 2025

Contents

A. Status of PSF's update on the implementation of PPP fiscal risk assessment and updates to PPP Policy Board

The following section of the risk report explains the general form of the risk report, the content of the various sections, and its implementation status based on the outline. The outline also highlights the need for further improvement in some key areas that are dependent on external factors. The report is addressed to its recipients within the PPP Framework, for examples PSF, PPP Unit, PPP Policy Board and the Board of PSF.

Table 1: Risk Report Outline

S.No	Process Outline/Objective	Status	Action Needed if any
1.	Project Wise Coverage for Projects approved by PSF Board	Under Implementation	This section provides recommendations for enhancing risk transference for the relevant stakeholders, namely the PSF BoD and the PPP Policy Board. Recommendations pertain to issues such as for instance, it's advisable for the GoS to prioritize the completion of its CPs prior to project implementation. Additionally, establishing well-defined KPIs to delineate performance expectations from private parties would contribute to a more comprehensive risk management approach.
2.	Sectoral Coverage for PPPs	Under Implementation	This section is intended to demonstrate the general overview of various sectors in which PPPs are

			implemented. It covers an evaluation of the risks, potential and realized benefits engendered by PPPs within these sectors while effectively mitigating the observed risks.
3.	Affordability and Contingent Liabilities for PPP projects approved by PSF Board	Under Implementation – Needs refinement in information retrieval	Enhancing this process involves refining both the accuracy and promptness of data. The financial model held by the IA for ongoing projects stands as one of the most reliable data sources. Additionally, prioritizing high-quality IE reports further contributes to the reliability of information.
4.	Affordability/Contingent Liabilities for PPP portfolio as a whole	Under Implementation - Needs refinement in information retrieval	This process can be further refined by improving the timeliness and veracity of the data.
5.	Work Done for the Quarter Ended March 2025	Under Implementation -	This section presents the work done by Risk Department in the relevant quarter. The format and content details are being improved upon.
6.	PPP Related Risk Issues/Methods	Under Implementation	In this section, any general matters which either explain a facet of PPPs in terms of risk related issues and/or methods which help in risk estimation etc. are to be outlined.
7.	Reflect the project costs as per RCF and RVA techniques so Cost and Schedule Over run is accounted for	Under Implementation – Needs refinement in information retrieval	This process can be enhanced by optimizing timely delivery of accurate data

B. Summary of the current risk report

This Risk Report serves multiple purposes such as:

i. Highlights project-specific risks and elaborates upon risk mitigation measures already embedded in the projects' Concession Agreement, and suggests risk mitigation measures for risks assessed by PSF.
ii. Provides a complete picture of fiscal commitments that the GoS may have to incur in the likely occurrence of the assessed risk events. These fiscal commitments include direct obligations, contingent obligations, and measures of affordability against available fiscal space.

A. Ongoing PPP Projects in Sindh Education Sector

During the quarter ended March 2025, School Education and Literacy Department, (SELD) and three Education Management Organizations (EMOs) i.e. successful bidders signed concession agreement of Girls' Elementary School Project. The project has outsourced O&M of 54 public sector schools, rehabilitated under Japan International Cooperation Agency (JICA) assistance. As stated earlier in previous quarterly reports, in the first phase of this project, SELD initiated the procurement process of 03 packages comprising 19 girls' elementary schools for public private partnership contracts. It is hoped that the execution of the contract will become effective from July 2025 after fulfilling the condition precedents of the concession agreement.

In respect of EMO-7, which was approved by the Board in January 2024, all the six packages have become operative during this quarter by performing the activities relating to Installation, Planning and Preparation (IPP) phase

During this reporting period, PSF again highlighted a very serious issue of delayed disbursement of annuity amounts to private partners. This issue is turning into a usual activity in quarterly reporting and payments in education sector PPPs. PSF pointed out its potential consequences which may turn into high risks to the success of the projects.

During this quarter, PSF continued to provide its technical support to PPP-Unit (Finance Department) and PPP-Node (SELD) in the following PPP projects at their preliminary stage(s):

- Sindh Secondary Education Improvement Project (SSEIP)
- Provision of Free Transport to the Girls Students of Grade 9-12 in Selected Districts
- Consultancy Services for Impact Assessment/ Study of EMO project under PPP mode
- Upgradation of facilities in selected colleges of Sindh (an unsolicited proposal from ADB)
- Establishment of ECE centers in model schools of Sindh (an unsolicited proposal from UNICEF)

Ongoing/Emergent Issues in Sindh Education Sector

Table 2: Ongoing and Emergent Issues in Education Sector

S.No	Project/Issue	Nature of Issue
1	Teachers Training Institutes - Delay in Rehabilitation Work	This project enters into a high-risk zone due to its long-delayed operation and ineffective IPP activities. As per provisions of concession agreement, IPP period would have been completed by the end of March 2025. However, there is no evidence if all required activities under IPP period have been completed successfully as PSF is still waiting for third party verification/ progress report of the activities.
2	Education Projects Overall – Contract Management	Contract management remains a prominent risk, primarily due to inadequate staffing at the **PPP Node of the School Education and Literacy Department (SELD)**, which also serves as the Project Implementation Unit (PIU) for the EMO reform initiative. Effective contract management continues to be a significant challenge, similar to the early stages of the project. Although a remedial strategy was introduced through the appointment of a Contract Compliance Manager, it has not delivered the intended results. Consequently, weaknesses in accountability persist. Other contributing factors to ineffective contract management include an insufficient number of staff, limited administrative authority and capacity to resolve project issues in a timely manner, and poor record-keeping practices at the PPP Node of SELD. Recently, the PPP Node has initiated progress monitoring of EMO projects through an online dashboard integrated with the data management system. This tool has the potential to enhance the efficiency of monitoring mechanisms; however, its effectiveness will only become evident over the next 2–3 quarters. This risk could be further mitigated by strengthening the human resources capacity at the PPP Node.

3	Education Management Organization Project - Data Management/ Availability of Effective Information System	Robust data management and an effective information system are fundamental deliverables of the EMOs, serving as key tools for monitoring and evaluating project progress. However, the existing system has been unable to provide real-time data on project status and performance, hampering timely decision-making and oversight. To address this gap, the PPP Node has developed a centralized **Education Management and Reporting System (EMIRS)**, where EMOs will be required to update and transfer their project data in real time. PPP Node has been asked to give the **Project Support Facility (PSF)** access to this EMIRS. Once successfully implemented, EMIRS is expected to mitigate several risks related to contract management, quarterly reporting, and project governance.
4	Delayed quarterly progress reports and annuity payments in EMO projects	This issue is emerging as a significant risk area, as several projects have experienced delays of over a year in submitting quarterly progress reports and processing annuity payments. The absence of timely reporting undermines visibility into current project performance, which in turn jeopardizes the achievement of project objectives and targets.

Affordability and Contingent Liability of Education Sector Projects

Although the **Girls Elementary Schools Project**, a new initiative in the education sector, was included in the previous quarterly report, the anticipated financial activities have not materialized. This delay may impact the overall financial landscape of the education PPP projects in the current quarter. Consequently, the assessments of affordability, contingent liabilities, and funding ratio will remain unchanged from the previous quarter.

As per the Affordability and Contingent Liability Analysis conducted by the PSF, both these amounts will not make an adverse financing burden on the GoS budgetary outlays and resources. Our findings are based on the following indicators:

For affordability analysis, the total bid cost of all education projects, so far, for 10 years' period was compared to the current FY 2024-25 ADP budget of GoS which ranges from 0.012% - 0.403% of the GoS provincial ADP Budget of FY 2024-25. When compared to the ADP budget of SELD for the same FY i.e. 2024-25, the EMO cost of all these projects shall have an impact range, in percentage terms, between 0.128 % (2016) and 4.141% (2024).

Table 3: Annual recurring obligations in Education PPPs i.e. EMOs and TTIs

											493,092.00	48,030
Year	EMO-1	EMO-2	EMO-3	EMO-4	EMO-5	EMO-6	EMO-7	TTIs	Total (EMOs+TTIs)	Total in Million	% of Provincial GoS-ADP 2024-25	% of Provincial SELD-ADP 2024-25
2016	61,437,904								61,437,904	61.44	0.012%	0.128%
2017	59,022,910	84,856,882							143,879,792	143.88	0.029%	0.300%
2018	62,934,982	65,909,743	286,973,716						415,818,441	415.82	0.084%	0.866%
2019	68,534,496	72,553,938	163,065,486	296,965,825					601,119,745	601.12	0.122%	1.252%
2020	72,481,312	78,124,444	181,541,039	135,395,648					467,542,443	467.54	0.095%	0.973%
2021	78,037,474	85,141,360	197,453,389	147,896,044	377,598,205				886,126,471	886.13	0.180%	1.845%
2022	84,819,841	90,951,542	208,516,956	163,417,024	183,849,508	140,361,818			871,916,689	871.92	0.177%	1.815%
2023	90,904,561	103,306,649	217,934,278	173,336,804	186,421,231	76,052,258		144,273,085	992,228,867	992.23	0.201%	2.066%
2024	97,425,198	108,765,504	266,146,314	188,243,032	219,165,519	82,791,155	958,212,491	68,079,370	1,988,828,584	1,988.83	0.403%	4.141%
2025	105,444,147	120,763,092	244,848,128	205,733,456	209,435,917	91,057,165	575,785,579	71,613,195	1,624,680,678	1,624.68	0.329%	3.383%
2026		130,883,929	267,004,519	227,936,504	221,203,410	100,476,777	580,016,352	77,915,532	1,605,437,022	1,605.44	0.326%	3.343%
2027			279,446,590	243,149,336	245,462,103	124,085,408	633,276,756	84,794,820	1,610,215,013	1,610.22	0.327%	3.353%
2028				264,810,864	236,580,748	121,118,881	692,913,402	100,373,595	1,415,797,490	1,415.80	0.287%	2.948%
2029					245,587,865	133,188,587	828,446,107	108,626,678	1,315,849,237	1,315.85	0.267%	2.740%
2030					259,352,468	146,961,938	852,710,147	109,567,147	1,368,591,700	1,368.59	0.278%	2.849%
2031						161,592,695	906,798,223	119,325,971	1,187,716,888	1,187.72	0.241%	2.473%
2032							993,563,474	129,960,756	1,123,524,230	1,123.52	0.228%	2.339%
2033							1,087,294,851	67,756,808	1,155,051,659	1,155.05	0.234%	2.405%
2034							277,773,958		277,773,958	277.77	0.056%	0.578%
	781,042,825	**941,257,084**	**2,312,930,414**	**2,046,884,537**	**2,384,656,972**	**1,177,686,682**	**8,386,791,341**	**1,082,286,957**	**19,113,536,811**	**19,113.55**		

The contingent liabilities as percentage of GoS-School Education provincial ADP Budget (without FPA) of current FY 2024-25 ranges from 0.49% (2033) – 1.00% (2024) for a period from 2024- 2033.

Table 4: Contingent Liabilities in Education PPPs i.e. EMOs and TTIs

Year	EMO-1	EMO-2	EMO-3	EMO-4	EMO-5	EMO-6	TTIs	EMO-7	Total	Percentage of Annual Development Budget		
										SELD @ Rs. 20.0 billion (without FPA)	SELD @ Rs. 48.03 billion (with FPA)	GoS @ Rs.493.09 billion
2016	4,200,000	-	-	-	-	-	-	-	**4,200,000**			
2017	4,220,000	7,671,394	-	-	-	-	-	-	**11,891,394**			
2018	4,242,000	7,766,394	34,024,146	-	-	-	-	-	**46,032,540**			
2019	4,266,200	7,869,394	21,660,897	-	-	-	-	-	**33,796,491**			
2020	4,292,820	7,981,119	24,235,756	14,848,291	-	-	-	-	**51,357,986**			
2021	4,322,102	8,102,363	26,157,853	6,769,782	34,482,192	-	-	-	**79,834,292**			
2022	4,354,312	8,233,995	27,512,480	7,394,802	19,333,017	10,039,636	-	-	**76,868,242**			
2023	4,389,744	8,376,966	28,432,289	8,170,851	19,848,746	9,287,475	14,841,291	-	**93,347,362**	0.47%	0.19%	0.02%
2024	4,428,718	8,532,320	33,596,916	8,666,840	23,611,194	10,172,662	19,538,339	92,253,437	**200,800,426**	1.00%	0.42%	0.04%
2025	4,471,590	8,701,200	32,241,407	9,412,152	23,121,025	11,189,929	21,034,861	48,430,577	**158,602,741**	0.79%	0.33%	0.03%
2026	-	8,884,857	34,932,419	10,286,673	24,439,612	12,308,921	22,649,024	52,816,935	**166,318,441**	0.83%	0.35%	0.03%
2027	-	-	36,316,000	11,396,825	27,641,628	13,963,092	24,390,350	57,623,553	**171,331,448**	0.86%	0.36%	0.03%
2028	-	-	-	12,157,467	27,417,960	14,893,795	26,269,159	62,891,540	**143,629,921**	0.72%	0.30%	0.03%
2029	-	-	-	13,240,543	28,801,147	16,383,174	28,296,633	73,952,817	**160,674,314**	0.80%	0.33%	0.03%
2030	-	-	-	-	31,754,554	18,021,492	30,484,893	74,996,775	**155,257,713**	0.78%	0.32%	0.03%
2031	-	-	-	-	-	19,823,641	32,847,081	81,938,219	**134,608,940**	0.67%	0.28%	0.03%
2032	-	-	-	-	-	-	35,397,446	89,550,355	**124,947,802**	0.62%	0.26%	0.03%
2033	-	-	-	-	-	-	-	97,899,081	**97,899,081**	0.49%	0.20%	0.02%

PSF Board so far approved seven projects (RFP#1 to RFP#7) of schools, one project of Teacher Training Institutes (3 TTIs) and one project of Girls Elementary School (JICA Assisted Schools phase-

I) in education sector for their funding from VGF-PSF. PSF provides support funds to these projects from new VGF with the financial assistance of the EPPP project effective from April 2018 to December 2024[1]. Whereas funding before that date i.e. April 2018 (if any) to be done through old VGF

The EPPP funding is provided by three agencies with ratio as below; - Partners' share formula has been given below;

Table 5: Funding Ratio of EPPP

EPPP Partner	Ratio of Funding Contribution			
	April 2018- June 2022	*July 2022- December 2022*	*January 2023- December 2024*	*January 2025- December 2026[2]*
ADB	58.49%	68.33%	76.49%	90%
FCDO (DFID)	6.99%	8.16%	NIL	NIL
GoS	34.52%	23.51%	23.51%	10%

- GOS to bear Tax Amount in addition to its agreed share.

Following table[3] elaborates PSF ratio separately and accumulative for funding support to all procurements under EMO reform and PPP mode[4].

Table 6: Funding Detail of PPP Education Projects by PSF

RFP#	No. of Schools	Total Bid Cost	Expenditure before EPPP	PSF-EPPP (April 2018-December 2024)				PSF-GoS	PSF Total
				Total EPPP Share	ADB+FCDO	GoS		From Jan 2025-onward	Outstanding till End of the Project
				Initial Ratio (Upto June 2022)	65.48%	34.52%	Tax		
				Revised Ratio (July 2022 and December 2022)	76.49%	23.51%		Outstanding	
				Current Ratio (July 2022 and December 2022)	76.49%	23.51%			
1	4	781,042,825	120,460,814	531,205,673	302,025,616	128,250,978	100,929,078	129,376,338	660,582,011
2	5	941,257,084	84,856,882	577,965,661	329,162,607	138,989,578	109,813,476	278,434,541	856,400,202
3	14	2,312,930,414	0	1,404,473,648	797,972,589	339,615,250	266,885,809	908,456,767	2,312,930,414
4	45	2,046,884,537	0	1,058,193,619	600,232,593	256,904,238	201,056,788	988,690,918	2,046,884,537
5	71	2,384,656,972	-	912,243,084	565,197,535	173,719,363	173,326,186	1,472,413,889	2,384,656,972
6	32	1,177,686,682	-	257,809,654	159,730,869	49,094,950	48,983,834	919,877,028	1,177,686,682
7	40	8,386,791,341	-	958,212,491	564,361,286	220,388,873	173,462,333	7,428,578,849	8,386,791,341
Sub-Total (EMOs)	**211**	**18,031,249,854**	**205,317,696**	**5,700,103,828**	**3,318,683,095**	**1,306,963,230**	**1,074,457,503**	**12,125,828,330**	**17,825,932,158**
TTIs	2	1,082,286,957	-	246,652,897	152,818,489	46,970,358	46,864,050	835,634,060	1,082,286,957
Total	**213**	**19,113,536,811**	**205,317,696**	**5,946,756,725**	**3,471,501,584**	**1,353,933,588**	**1,121,321,553**	**12,961,462,390**	**18,908,219,115**

[1] The terminal date of EPPP period has been extended till December 2026. The updated funding amount of all approved projects will be provided in next quarterly report. .

[2] This funding ratio has been kept changing, after mutual agreement between ADB and GoS, initial ratio was applicable till June 2022 (EMO 1-5); revised ratio was applicable from July 2022 to December 2022 (EMO-6 and TTIs), then updated ratio was applicable from January 2023 to December 2024 (EMO-7) and current ratio is applicable from January 2025 to December 2026. The projects approved between January 2025 and December 2026 will be funded by EPPP funds in ratio of 90% and 10% by ADB and GoS respectively. All funding amount is taken from relevant PARs as approved by PSF Boards.

[3] Extracted from approved PARs of all i.e. RFP#1 to RFP#7 and TTIs. However, the cost of Girls Elementary School Project is not included as the project is in process of procurement.

[4] This amount will be updated in next quarterly report due to change in partner's contribution ratio, addition of new projects and extension of EPPP funding date.

As such 57% (Rs. 10.91 billion) of total bid cost (Rs. 19.11 billion) of all education PPP projects approved by PSF Board is projected as payable amount by PSF from April 2018 till project life (*each project is of 10-year duration except TTIs which is of 10.5 year and EMO-7 as of 10.25 years)* of each school/project.

The cumulative funding of education PPP projects is projected as amount of Rs. 6,016[5] million which accounts for 19.07% of total EPPP project.

Table 7: Funding and its proportions in EMOs

Partner Name	VGF Amount under EPPP (US$)	PKR Amount @ PKR/USD 278.22*	% Loan**			Total-Education PPPs (EMOs+TTIs)	Education PPPs' % of Total VGF
			Initial	Revised	Current[6]		
ADB	70	19,475	58.50%	68.30%	76.50%	3150	16.17%
FCDO	11.41	3,174	7.00%	8.20%	0.00%	309	9.74%
GoS	25.02	6,961	34.50%	23.50%	23.50%	1297	18.63%
Taxes (GoS)						1260	18.10%
Total	**106.43**	**29,611**	**100%**	**100%**	**100%**	**6016**	**20.32%**

B. Ongoing PPP Projects in Sindh Health Sector

During the current reporting period, one additional health sector PPP project — **Outsourcing Management of the Regional Blood Centre (RBC), Sukkur** — was approved by the PSF Board. As a result, a total of three health sector projects have now been approved:

1. Outsourcing Safety and Security Services at JPMC
2. Outsourcing Management of Regional Blood Centre (RBC) — Jamshoro
3. Outsourcing Management of Regional Blood Centre (RBC) — Sukkur

Funding support for RBC Jamshoro under the EPPP (Expanded Program on Public-Private Partnerships) was concurred by the Asian Development Bank (ADB) earlier in the reporting year. Subsequently, the PSF received a request to provide similar funding support for RBC Sukkur. PSF Board approved funding for this project in January 2025, following pre-clearance by the IFRMC in December 2024.

[5] *Amount difference is due to changing exchange rates. All these amounts were calculated till due payments under EPPP till December 2024. After the amendment in the EPPP contract is formally agreed to extend the project till December 2026, these amounts and shares of percentages is likely to be going to change accordingly. .*
[6] *The current ratio is 90% (ADB) and 10% (GoS) for the period January 2025 to December 2026. This funding outflow will be updated in next quarterly risk report.*

During this reporting quarter, the Project Appraisal Report (PAR) for RBC Sukkur has also been shared with ADB for their concurrence of its funding under EPPP.

The other details of the previously approved projects remain unchanged from the last report. An extract is reproduced below for reference and perusal:

- The **JPMC project** is currently in the procurement phase; therefore, its actual financial implications are not included in this report.
- **RBC Jamshoro** is a sub-project of the broader Outsourcing Management of Four RBCs in Sindh initiative. The project commenced in 2018 under a management contract between the Health Department, Government of Sindh, and the Indus Hospital Network. Initially, the scope was set at screening 20,000 blood bags annually. However, within the first year of operation, screening capacity expanded to 70,000 blood bags annually. Following a request from the operator to revise the scope, a detailed review was conducted, and an amended agreement was finalized. The revised scope now includes screening of 100,000 blood bags annually, with an updated project cost of Rs. 5.7 billion for the 10-year project period ending in 2028.
- **RBC Sukkur** is another sub-project of the broader Outsourcing Management of Four RBCs in Sindh initiative. The project commenced in 2018, parallel to RBC Jamshoro, under a management contract between the Health Department, Government of Sindh, and the Sukkur Blood and Drugs Donating Society (SBDDS). Initially, the scope was set at screening 20,000 blood bags annually, same as of RBC Jamshoro. However, its screening capacity also expanded beyond its allocated capacity of 20,000 blood bags annually. Following the instructions by PPP Policy Board to conduct the review of the project's scope on the pattern of RBC Jamshoro, a detailed review has been conducted by third party, however, still an amended agreement isn't finalized. Therefore, its project cost remains as of its approved financial bid of Rs. 2.9 billion for the 10-year project period ending in 2028.

Table 8: Ongoing/ Emerging Issues in PPP Projects in Health Sector

S. No	Project/Issue	Nature of Issue
1	JPMC	The Request for Proposals (RFP) for the JPMC project has not been launched in the reporting period, though it is anticipated to be issued soon. PSF actively provided technical feedback to support the development of the project structure and assess its viability for implementation under the PPP mode. In addition, PSF contributed detailed inputs during the drafting of key project documents, including the RFP and the management contract.

		However, PSF has been unable to verify whether its feedback on the draft management contract has been fully addressed. Throughout the period, PSF has maintained continuous follow-up, regularly reminding the PPP Unit and the PPP Node of the Health Department to incorporate and respond to PSF's observations accordingly. Furthermore, during its first meeting, the Technical and Financial Evaluation Committee (TFEC) of the JPMC project provided observations on the proposed project structure and recommended certain modifications. PSF formally requested the PPP Unit and PPP Node to share these observations and any subsequent changes to the project structure. As of the end of this reporting period, a response is still awaited.
2	RBC Jamshoro	The RBC Jamshoro Project, initiated in 2018, has now entered its sixth year of the total 10-year project period. Both the scope and cost of the project have been revised upward due to demand for blood bags exceeding the initial projections. However, a key concern has emerged: four out of seven Hospital-Based Blood Banks (HBBs) have not been operationalized during the first half of the project's lifecycle. If the non-operationalization of these four HBBs persists, the project's ability to achieve its intended objectives may be significantly compromised. Consequently, this situation could escalate the project's risk profile from its current low risk level to a **higher risk level** in subsequent reporting periods. The high levels of utilisation of bags and inventory levels also need to be continuously monitored. Hemovigilance data C/T ratio, %T and TI as quality indicators used to assess blood utilization efficiency and Maximum Surgical Blood Order Schedule (MSBOS), to prevent unnecessary testing and blood wastage. It's highly unlikely that cross match to transfusion falls below 1. Blood donation recruitment policy, and Hemovigilance forms, not should be upto standards

3	RBC Sukkur	The RBC Sukkur Project commenced operations under the PPP mode alongside RBC Jamshoro in 2018 and has now successfully completed six years of its 10-year project period. During implementation, at the request of the Health Department, three satellite Hospital-Based Blood Banks (HBBs) were incorporated into the original scope of work assigned to the private operator. However, this expansion was undertaken without revising the associated financial allocations and the relevant approvals for need to be in place, as such an amendment to the concession agreement may be required This development may strain both the administrative and financial capacity of the private operator, potentially undermining the effective achievement of the project's goals and objectives. If these concerns persist unaddressed, the project's risk rating—currently assessed as low—may escalate to a medium risk level in future reporting periods. The high levels of utilisation of bags and inventory levels also need to be continuously monitored. Hemovigilance data C/T ratio, %T and TI as quality indicators used to assess blood utilization efficiency and Maximum Surgical Blood Order Schedule (MSBOS), to prevent unnecessary testing and blood wastage. It's highly unlikely that cross match to transfusion falls below 1. Blood donation recruitment policy, and Hemovigilance forms, should be up to standards. Issues related to QC and trainings and competencies of staff, Planned Preventive Maintenance (PPM) records and utilization of funds from capital accounts for operational purposes need to be addressed.

Affordability and Contingent Liability of Health Sector Projects

As per the Affordability and Contingent Liability Analysis conducted by the PSF, both these amounts will not make an adverse financing burden on the GoS budgetary outlays and resources. Our findings are based on the following indicators:

For affordability analysis, the total bid cost of health sector projects, currently with financial impact, for 10 years' period was compared to the current FY 2019-27 ADP budget of GoS which ranges from 0.08% - 0.22%. When it is

compared to the ADP budget of Health Department for the same period, the project cost shall have an impact range, in percentage terms, between 1.32% % (2025) and 5.21%% (2027).

Table 9: Annual recurring obligations in RBC Jamshoro and RBC Sukkur

Total Budget Outlay for Health Sector PPP Projects				
Year	RBC Jamshoro	RBC Sukkur	% of Health Department Budget	% of Health ADP
2019	211,536,249	207,806,732	0.38%	2.83%
2020	219,997,699	213,001,901	0.31%	2.79%
2021	228,797,607	218,326,948	0.24%	1.32%
2022	578,695,890	223,785,112	0.41%	3.77%
2023	754,048,075	229,379,750	0.55%	5.03%
2024	823,396,412	235,114,244	0.57%	5.21%
2025	768,416,929	240,992,100	0.45%	2.56%
2026	825,629,998	247,016,902	0.45%	2.51%
2027	887,284,790	253,192,325	0.47%	2.90%
	5,719,205,063	**2,494,693,536**		

The contingent liabilities as percentage of GoS and Health Department provincial ADP Budget of current FY 2024-25 ranges from 0.19% (2024) – 0.11% (2027).

Table 10: Contingent Liabilities in Health PPPs i.e. RBC- Jamshoro and RBC Sukkur

Year	RBC Jamshoro	RBC Sukkur	Percentage of Annual Departmental Budget	Percentage of ADP
2019	15,669,352	17,158,354	0.03%	0.22%
2020	16,296,126	17,587,312	0.02%	0.22%
2021	16,947,971	18,026,995	0.02%	0.10%
2022	17,625,890	18,477,670	0.01%	0.08%
2023	18,330,925	18,939,612	0.02%	0.19%
2024	19,064,162	19,413,102	0.02%	0.19%
2025	19,826,729	19,898,430	0.02%	0.10%

2026	20,619,798	20,395,891	0.02%	0.10%
2027	21,444,590	20,905,788	0.02%	0.11%

PSF Funding Ratio

PSF Board so far approved three projects of health sector which include Provision of safety and security services in JPMC Karachi and operation & management of RBC Jamshoro and RBC Sukkur for their funding from EPPP funds through VGF-PSF.

The EPPP funding is provided by three agencies with ratio as below; - Partners' share formula has been given below.

Table 11: Funding Ratio of EPPP

EPPP Partner	Ratio of Funding Contribution			
	April 2018- June 2022	*July 2022- December 2022*	*January 2023- December 2024*	*January 2025- December 2026*[7]
ADB	58.49%	68.33%	76.49%	90%
FCDO (DFID)	6.99%	8.16%	NIL	NIL
GoS	34.52%	23.51%	23.51%	10%

- GOS to bear Tax Amount in addition to its agreed share.

Following table[8] elaborates PSF ratio separately and accumulative for funding support to all procurements PPP mode.

Table 12: Funding Detail of PPP Health Projects by PSF

S. No.	Project Name	HMO	Bid Cost	Bid Cost under EPPP (April 2018 to December 2024)[9]	ADB Share	GoS Share	Remaining Amount to be paid by GoS through PSF
			10 years budget	*Inclus. of Tax*	*76.49%*	*23.51%*	*After December 2024 till end of project life*
1	RBC Jamshoro	Indus Health Network	*5,719,205,603*	*3,058,629,756*	*2,339,545,900*	*719,083,856*	2,660,575,847
1	RBC Sukkur	Sukkur Blood and Drugs Donating Society (DBDDS)	2,494,693,540	1,635,935,087	1,251,326,748	384,608,339	858,758,453

[7] *This funding ratio has been kept changing, after mutual agreement between ADB and GoS, initial ratio was applicable till June 2022 (EMO 1-5); revised ratio was applicable from July 2022 to December 2022 (EMO-6 and TTIs), then updated ratio was applicable from January 2023 to December 2024 (EMO-7) and current ratio is applicable from January 2025 to December 2026. The projects approved between January 2025 and December 2026 will be funded by EPPP funds in ratio of 90% and 10% by ADB and GoS respectively. All funding amount is taken from relevant PARs as approved by PSF Boards.*

[8] *Extracted from approved PARs of RBC- Jamshoro. However, the cost of JPMC is not included as the project is in process of procurement.*

[9] After extension of EPPP period up to December 2026, this funding detail will be updated in next quarterly risk report in accordance with new ratios.

	Total	**8,213,899,143**	**4,694,564,843**	**3,590,872,648**	**1,103,692,195**	**3,519,334,300**

The cumulative funding of health PPP projects is projected as amount of Rs. 4,297[10] million which accounts for 13.4% of total EPPP project.

Table 13: Funding and its proportions in PPP projects in Health Sector

Exchange Rate	281.347

Project Draw Down Amount[11] (PKR in Million)							
Partner Name	**VGF under EPPP (US$)**	**VGF under EPPP**	**% Loan Ratios[1]**	**Health Sector**			
			Updated	**RBC Jamshoro**	**RBC Sukkur**	**Total-2**	**% share of VGF**
ADB	70.00	19,694	61.5%	2,035	1,251	**3,286**	10.3%
FCDO	15.43	4,341	13.5%	-	-	**-**	0.0%
GoS	28.48	8,013	25.0%	626	385	**1,011**	3.2%
Total	**113.91**	**32,048**	**100.0%**	**2,661**	**1,636**	**4,297**	**13.4%**

Table 14: Project approved by PSF Board yet to be tendered

S. #	Project Name/ Stage	PSF Board Status	Project Status /Policy Board	Remarks/Comments
	JPMC/ Pre-Procurement Phase	This project has been conditionally approved by the PSF Board. Government has decided to launch the RFP soon.	TFEC held the first meeting and shared some observations with the consultant to address them accordingly. The procurement documents are being finalized by the consultant. Hopefully, the project may be launched in the next quarter.	In PSF's view the concession agreement can be strengthened further and the comments in this regard have been shared by PSF with the PPP Unit. A comprehensive service/ops manual should also be prepared with KPIs clearly linked to each service area.

[10] This funding amount under EPPP has been calculated on basis of project termination date till December 2024. As mentioned earlier in education sector project reports, the EPPP project has been extended till December 2026 . The funding amount will likely to be updated accordingly. .

[11] Ibid

Transport, Road and Matorways Sector

To date, GoS has 8 ongoing transport and road projects, three of which have achieved construction completion, namely Hyderabad Mirpurkhas Dual Carriageway, Jhirk Mulla Katiyar Bridge Project and Karachi Thatta Dual Carriageway Project. Three further projects are under construction, these include Ghotki Kandhkot Bridge Project, Link Road Project and Malir Expressway Project (partially completed). PSF has reviewed three of these projects since 2019 and two of these namely Ghotki Kandhkot and Malir Expressway were conditionally approved by PSF Board subject to compliance with E&S safeguards. ADB has however, dropped these from the priority list of projects to be undertaken under EPPP funding. While the rest 02 projects include Procurement and Operation of Yellow Line Buses in Karachi and Malir Expressway Phase-1 projects. PSF has been involved in the review process of these two project and has provided its feedback on the feasibility study of O&M of Yellow Line Buses project as well as on the USP & its preliminary review report for Malir Expressway Phase-1 project.

Social Sector Projects

Table 15: Education PPP/ Health PPPs approved

Project	No of Packages/Facilities	PSF Approved on	Total Pro1ect Cost	**Project Duration**	Estimated Number of Beneficiary
EMO·l	04 packages/04 schools	19 08 2019	PKR 781,042,825	10 years April 2016· April 2026	3000 students
EM0·2	05 packages/05 schools	19 08 2019	PKR 941,257,084	10 years February 2017· February 2027	5000 students
EM0·3	14 packages/14schools	04 02 2020	PKR 2,312,930,414	10 years February 2018·February 2028	10000 students
EM0·4	04 packages/45 schools	31 03 2021	PKR 2,046,884,537	10 years April 2019· April 2029	25000 students
EM0·5	05 packages/71 schools	27 06 2021	PKR 2,384,656,972	10 years January 2021·January 2031	35000 students
EM0·6	03 packages/32 schools	29 12 2021	PKR 1,177,686,682	10 years April 2022· April 2032	15000 students
EM0·7	06 packages/40 schools	20 12 2023	PKR 8,386,791,341	10.25 years, September 2024- December 2034	25000 students
Teacher Training Institutes (TTls)	02 TTls	06 04 2022	PKR 1,082,286,957	10.5 *years*, **September 2024· March 2035**	3500 pre-service and 6000 in service teachers
Girls' Education Project Phase-I	19 girls' schools	09-07-2024	PKR **2,353,222,783**	10 years	9000 girls students

				July 2025- June 2035[12]	
RBC Jamshoro	01 RBC linked with 7 HBBs	09 07 2024	PKR 5,719,205,063	10 years, February 2018·February 2028	1,500,000 patients
RBC Sukkur	01 RBC linked with 7 HBBs	09 01 2025	PKR 2,494,693,536	10 years, February 2018·February 2028	600,000 patients

Education Sector

Education Management Organization (EMO) reform is one of the GoS initiative focusing on the objectives of improved access and governance, better quality education and effective utilization of public resources. For this purpose, the operation and management of selected public schools/institutes is outsourced to credible and experienced private sector parties to make them helpful in achieving the targets as set out in Key Performance Indicators (KPI) framework based on the objectives of the EMO reform.

The PPP Support Facility (PSF) has, to date, approved funding of 230 schools and 3 (three) Teacher Training Institutes (TTIs), which were outsourced under 9 rounds of procurements,[13] amounting to PKR 22,096 million in terms of nominal value. However, one of the operators of the TTI project requested to withdraw his offer to operate the GECE Sukkur which turned the project comprising 2 (two) TTIs lowering the project amount to PKR 21,466 million.

The overall risk profile of the project is low as PSF is of the view that the Concession Agreements have satisfactorily allocated the perceived risks between the Government and the private parties which might be got further mitigated if implemented with true spirit.

Table 16: Education PPP (number of institutes and funding)

Education PPPs	# of Procurements	# of Schools	Funding Approved (Rs. In mn)
EMOs- SBEP	7	211	18031.249
TTIs	1	2	1082.287
EMOs-JICA	1	19	2353.222

Health Sector

GoS has initiated numerous health projects under PPP modality which included operations and management of health facilities through Health Management Organizations, outsourcing security and safety services at National Institute of Child Health (NICH), operation and management of Regional Blood Centers (RBCs) etc.. PSF has reviewed all of the aforementioned.

[12] *Anticipated date of execution of the project after fulfilling of the condition precedents by both the parties, separately and jointly*.

PSF has principally approved the structure of the health sector project to procure a management contract with a credible private partner for provision of safety and security services at Jinnah Post Graduate Medical Centre (JPMC) Karachi. The PSF Board, in its meeting held on 17th January 2023, approved to fund the project with some advice to review and explore an option if the salary of human resource under this project may be sorted out from VGF (old VGF).

The Health Department constituted a Technical and Financial Evaluation Committee (TFEC) to launch the JPMC project. The TFEC, in its first meeting, proposed some changes in the structure of the project and asked the consultant to prepare the final draft of project documents based on the revised structure. PSF has asked PPP-Unit and PPP-Node of the health department to share the changes for assessing whether they might be considered substantial changes. In that case, PSF Board will be presented the changes to get their approval accordingly.

Minutes of the meeting is in process of signing by TFEC member, RFP to be launched soon after minutes are signed from all members.

Apparently, a potential financial risk may be faced by the project due to the delay in the procurement process.

PSF Board, in its meetings held on 14 July 2024 and 09 January 2025, also approved two health sector project i.e. Outsourcing the management of RBC Jamshoro and RBC Sukkur for its funding from EPPP. The project cost of RBC Jamshoro is estimated as PKR 5,719 million out of which PKR 3,059 million will be funded from EPPP with effective date from April 2018 to December 2024. Whereas the project cost of RBC Sukkur is estimated PKR 2,494 million out of which PKR 1,636 million will be funded from EPPP w.e.f. April 2018 to December 2024.

After extension of EPPP project till December 2026, the EPPP funding for both projects i.e. RBCs Jamshoro and Sukkur will be revised accordingly and will be updated in next quarterly risk report.

The project has been operated by private partners for more than six years. Based on the progress evaluation reports by the Independent Expert, the project may be categorized, overall, at low risk.

Water Supply Sector

The Government of Sindh is working on multiple projects for the supply of water transmission, filtration and distribution. These include Nabisar Vajihar project (under construction) TP1, (Feasibility completed), TP4, 5MiGD Desalination Project, 65 MiGD water supply project.

Table 17: General Risks of PPP Projects

Ongoing projects / Under Development	General Issues/Lessons from projects
Road Construction Projects *Malir, Ghotki,*	• Lack of good quality feasibility studies with accurate estimates • Define and lock in baseline, cost, scope, timeline • Identify all E&S impacts • Define comprehensive Key Performance Indicators • Risk transference, need to transfer design, construction and maintenance risk completely • Identify all potential relief events • Land procurement needs to be completed in all respects along the ROW, all affectees need to be paid prior to start of construction • Detailed design completed and approved prior to start of construction • All tests completed before start of construction, • Financial Close achieved before start of construction • IA/IE fees paid through independent escrow • IA/IE approvals mandatory • No deemed approval for essential aspects such as detailed design, test, financial close, E&S safeguards • Change of Scope limited to ancillary activities not for scope necessities missed in the original baseline • Escalation on four major items initial 10% on concessionaire thereafter equally. • Ownership from the department and administrative arrangements on ground i.e. PD, PMiU, Land Revenue department etc. • Recurring monitor as-built drawings, conduct tests, and approved by IA/IE

	• Monitor schedule and cost variance and estimate cost at completion • The treatment of alternatives also varies; sometimes alternatives are not considered in any detail, other times alternatives are addressed early in the study and it is only the favored alternative which is taken forward for detailed study. • comparisons of the order of costs for alternative schemes to select the most suitable scheme[14] • It is essential that there is close cooperation between those undertaking environmental assessment, and those undertaking the other aspects of pre-feasibility and feasibility studies. • Civil works implementation schedule should be synchronized with the land acquisition and implementation of LARPs and construction works should only be allowed in sections where land acquisition is completed and implementation of LARP is confirmed. • Once a contract between owner and contractor has been executed, the construction drawings acquire the status of legal documents: They are instruments of the contract, as well as the focal point of the construction process. • Claims in construction contracts, are governed by FIDIC conditions, and may be raised on those FIDIC conditions. • Technical Requirements of project structuring, also requires a general layout plan that also shows the location of the project and a setting out plan, general arrangement of the major elements of the projects (e.g. structures), and detailed drawings. • General layout plan of a project should contain sufficient details of the Works such as *dimensions, levels and sections of the main items of the project, works sites, works areas, borrow areas, major traffic diversion schemes during construction, and a key plan showing the geographical location of the Works.* • design has to be correctly translated onto drawings, i.e. the details correspond with design assumptions, philosophies and calculations.

[14] https://rds.eppingforestdc.gov.uk/documents/s75459/C-067%20Civic%20Offices%20Review%20BP%20VI.pdf

	• schematic design should be undertaken by taking into consideration of aspects, such as types of suitable geotechnical works, general layout, building configuration, road alignment etc., with a view to enhancing the cost-effectiveness. • Detailed drawings should include *reinforcement details, drainage details, utilities, etc.* • The scale of the general layout plan should be appropriate to the nature and size of the works but generally 1:200, 1:500 or 1:1000 are preferred. • Standards of drawings for projects should conform to the requirements of the Computer-Aided-Drafting (CAD)' • good practice to document the design criteria in a design memorandum for future reference. • There is a need to avoid abortive work and delay to the project (designing) due to changes in site conditions, design requirements or other circumstances after completion of the preliminary design • Checking Engineer (IE) should be is given drawings of the Works as designed, the design memorandum, other information on functional/performance requirements and applicable design standards of the Works, but without the design calculations. The Checking Engineer (IE) should then verify the design as shown on drawings by executing an independent set of calculations.
Water Treatment/transmission project TP1	• Prioritization of projects essential • Define comprehensive Key Performance Indicators • Meet all E&S requirements • Consider Affordability and contingent liability • Land procurement should be completed prior to tender or engagement with private concessionaires • All approvals in place prior to commencement • Engage local contractors as much as possible • Maximum reliance on local equipment and content, • park offshore risk with onshore contractor, recover sites, no horizontal defenses or Extension of Time (EOT)

	• Avoid International Arbitration • Recurring monitor as-built drawings, conduct tests, and approved by IA/IE • Monitor schedule and cost variance and estimate cost at completion
Management Contracts Health, HMOs, EMOs, TTIs, RBCs	• **<u>Key Challenges and Common Issues</u>** • Selection of Consultants: Difficulty in identifying and engaging credible consultants for conducting robust feasibility studies of proposed PPP projects. • Delivery of Project Outputs: Challenges in meeting defined deliverables due to inadequate due diligence of technical requirements and ineffective monitoring of key performance indicators (KPIs). • Alignment of Service Levels and Resources: Need to appropriately calibrate service levels to available resources (e.g., number of beds for HMOs or number of blood donors in RBC projects). • Baseline Data and Verification: Insufficient availability of reliable data and timely information for establishing evidence-based baselines, which should be verified by the Independent Evaluator (IE). • Stakeholder Coordination: Gaps in adhering to clearly defined stakeholder consultation roles, particularly during the conceptualization phase of PPP projects. • Timelines and Process Adherence: Persistent challenges in following stipulated timelines for pre-feasibility, feasibility, project preparation, initiation, and execution, as required under the PPP framework. • **<u>Lessons Learned and Recommended Practices</u>** • Adopt competitive procurement processes; avoid direct awards and minimize post-contract negotiations or amendments to project structures. • Ensure all pending construction or supply works are completed before tendering the project. • Complete all codal formalities related to the handover of primary and ancillary facilities before project commencement.

	• Clarify and ensure that Independent Evaluators/Independent Auditors (IE/IA) fully understand their scope of work and diligently submit timely reports and approvals. • Allow the concessionaire full responsibility for construction, refurbishment, maintenance, and repairs as per contract terms. • Prevent any delays in escrow account opening and handover of facilities to avoid operational bottlenecks. • Strengthen and adequately staff PPP Nodes/PMIU to ensure effective contract enforcement and oversight. • Proactively identify and resolve bottlenecks that may hinder project implementation. • Ensure the timely and diligent fulfillment of Conditions Precedent (CPs) and avoid practices of delaying or deferring CPs. • Reinforce that all stakeholders fulfill their roles diligently during project design, preparation, execution, and monitoring, in full compliance with the Sindh PPP Act and applicable framework.

1. Size of PPP portfolio, relative budgetary position

Over the past 10 years Government Development space has been shrinking due to increasing non development outlay and weak revenues due to reliance on federal transfers which have ranged around 80% of the total revenues. The Development space on average has remained around 15% which doesn't account for PPP Projects as on average one project has featured in any fiscal year and of that PPP liabilities (outlays) are usually on accrual basis.

2. Affordability Analysis:

Affordability analysis is a key element, used to ensure that an individual / entity's fiscal obligations remain under budget and no untoward large burden surfaces later on in the project.

Methodology employed:

PSF employed the following methodology to conduct an Affordability Analysis:

1. Analysis of annual fiscal commitments, using a forecast budget limit approach on how overall budget limits will evolve and considers whether the estimated annual payments for projects could be accommodated.
2. Cumulative analysis of PPP projects within an Agency/Departmental Portfolio with their ADP allocations/projections.
3. Agency wise cumulative PPP outlays versus the Annual Development Plan of the Government of Sindh

3. Project Wise Cost Impact

Table 18: Estimated Projects Costs with Risk Estimates (All PPP Projects)

S.No	Projects in Operations (Post Debt Payoff)	Inception Date	Total PV of Cost	PV of Construction Cost	PV of O&M Cost	Prior Yr	Current Year	Next Year	Next 5 Years
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
1	Hyderabad MirpurKhas	2010	7,603,668,296	6,045,000,000	4,236,470,478	-	-	-	-
	Projects in Operations (Prior to Debt Payo	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
2	Jhirk Mulla Katiyar	2013	14,477,930,506	4,300,000,000	5,532,359,109	329,160,017	365,628,225	415,446,528	2,222,716,159
3	Karachi Thatta Dual Carrigeway	2015	28,807,798,408	8,856,298,066	15,930,972,000	1,834,326,411	1,581,701,581	1,114,095,572	6,216,216,271
4	Malir Expressway	2024	105,041,245,244	57,416,829,863	47,624,415,381	1,528,028,418	4,510,234,719	6,250,413,566	24,597,769,863
	Projects in Construction/Implementation	**Inception Date**	**Total PV of Project Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF/EAC/PB Minutes	RVA	RCF	2024	2025	2026	Sum of RCF
5	Ghotki Kandhkot Bridge Project	2018	50,009,400,000	30,500,000,000	48,437,268,591	956,438,474	242,236,242	243,913,940	36,158,721,698
6	Link Road	2023	1,966,768,000	1,966,768,000	NA	NA	NA	NA	NA
7	Nabisar Vajihar	2022	276,753,695,951	69,100,000,000	207,653,695,951	4,755,125,160	6,844,874,840	24,963,523,742	121,308,887,926
8	Education Management Organisation	2016	10,696,449,044	NA	10,696,449,044	1,859,984,675	1,497,415,328	1,477,042,620	7,489,528,201
9	Teachers Training Institutes	2017	1,514,800,000	NA	1,514,800,000	110,494,157	67,557,855	68,600,884	445,088,666
10	NICH Security and Safety Project	2013	544,600,000	NA	544,600,000	1,257,650,026	89,636,715	-	149,892,507
11	Health Management Organisations	2016	68,307,728,109	NA	68,307,728,109	2,096,189,819	2,281,179,349	2,395,694,318	5,675,196,895
12	Childrens Hospital North Karachi	2017	6,160,000,000	NA	6,160,000,000	857,098,981	942,808,879	1,037,089,766	1,714,197,961
13	Sindh Medical Support Program	2017	1,526,823,783	NA	1,526,823,783	-		-	-
14	Aman Ambulance	2017	1,873,390,892	NA	1,873,390,892	-	-	-	-
15	Regional Blood Centres	2019	15,260,000,000	NA	15,260,000,000	477,580,478	493,243,002	509,446,008	2,269,122,281
	Project Post Financial Close	**Inception Date**	**Total PV of Project Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Project Post Tender FBC	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
	Projects Post Full Feasibility	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
16	JPMC Safety and Security Project	2024		379,580,419	2,021,688,692	-	240,797,804	295,226,800	1,480,858,480
17	NED Technology Park	2024	3,294,350,407	22,359,166,497	1,715,962,803	-	88,048,237	261,345,260	2,806,643,918
	Projects During Feasibility	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
18	TP 1	2024	105,518,917,010	39,579,834,758	90,823,487,642	8,039,378,083	16,078,756,166	14,429,411,308	71,035,825,088
19	TP 4	2024	106,852,169,707	196,337,412,759	230,005,060,249	-	27,787,500,000	14,962,500,000	142,605,661,926
20	5 MiGD	2024	54,386,461,292	14,528,616,807	51,933,866,910	-	5,187,450,912	5,249,017,812	24,306,923,073
21	Malir Expresway Project PH 1	2025	207,379,204,381	83,979,480,000	123,399,724,381	-	4,138,287,440	4,361,712,560	38,209,100,854
22	Marble City	2024	14,633,627,941	10,528,947,000	-		-	8,087,414,564	14,633,627,941
23	Sukkur Water Distribution (USP)	2025	200,615,288,405	39,366,610,405	161,248,678,000	-	-	-	33,862,222,380
25	Yellow Line Project	2025	86,365,430,080	42,266,404,770	44,099,025,309	-	-		27,842,569,557
26	Rani Bagh	2024	-	6,273,853,183					
27	Shaheed Benazir Bhutto Park Project	2024							
28	Carbon Reduction Project - Carbon Credits	2024							
29	Management & Operation of Public Sector	2025							
30	Drug Rehabilitation Centres	2024	193,550,024		331,795,309		20,904,444	25,294,377	73,745,056
	Projects Prior to Feasibility	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
			RCF	RVA	RCF	Actual	As Incurred	RVA	Sum of RCF
	Total PPP Portfolio Risk Adjusted Cost		**1,296,108,586,695**	**631,818,034,528**	**1,069,170,319,850**	**22,005,264,880**	**70,177,082,388**	**83,751,495,306**	**559,429,319,807**

Table 19: Estimated Projects Costs with Risk Estimates (PSF Approved Projects)

S.No	Projects in Operations (Post Debt Payoff)	Inception Date	Total PV of Cost	PV of Construction Cost	PV of O&M Cost	Prior Yr	Current Year	Next Year	Next 5 Years
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
	Projects in Operations (Prior to Debt Payo	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
	Projects in Construction/Implementation	**Inception Date**	**Total PV of Project Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF/EAC/PB Minutes	RVA	RCF	2024	2025	2026	Sum of RCF
1	Education Management Organisation	2016	10,696,449,044	NA	10,696,449,044	1,859,984,675	1,497,415,328	1,477,042,620	7,489,528,201
2	Teachers Training Institutes	2017	1,514,800,000	NA	1,514,800,000	110,494,157	67,557,855	68,600,884	445,088,666
3	Regional Blood Centres	2019	15,260,000,000	NA	15,260,000,000	477,580,478	493,243,002	509,446,008	2,269,122,281
	Project Post Financial Close	**Inception Date**	**Total PV of Project Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Project Post Tender FBC	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
	Projects Post Full Feasibility	**Inception Date**	**Total PV of Cost**	**PV of Construction Cost**	**PV of O&M Cost**	**Prior Yr**	**Current Year**	**Next Year**	**Next 5 Years**
	Adjustment		RCF	RVA	RCF	2024	2025	2026	Sum of RCF
4	JPMC Safety and Security Project	2024		379,580,419	2,021,688,692	-	240,797,804	295,226,800	1,480,858,480
	Total PPP Portfolio Risk Adjusted Cost		**27,471,249,044**	**379,580,419**	**29,492,937,736**	**2,448,059,310**	**2,299,013,989**	**2,350,316,312**	**11,684,597,629**

Table 20: Government Guarantees in PPP Projects under Implementation

Sr. No	Project Name	Project Description	Contract Term	Capital Struture	Guarantee Type	Date on Guarantees were issued	Risk Coverage	Project Cost	Risk Coverage	Guarantee Amount/(Outstanding)
1	HMDC	58.7 Km Carrigeway	32 (2 Construction+ 30 O&M)	40% Debt, 30% Pvt Equity, 30% GoS (Sub Debt)	ntee Given/ No debt Out	NA	FR, DR, ES, COS, COR (TOR), OMR, TR	6,045,000,000	NA	NA
2	JMK	1.75 Km Bridge and 24.5 Kn	27 (2 Construction+ 25 O&M)	75% Debt, 25% Equity (13% Pvt, 12% GoS)	ntee Given/ No debt Out	NA	FR, DR, ES, COS, COR (TOR), OMR, TR	4,300,000,000	NA	NA
3	KTDC	49.5 km dualized road	27 (2 Construction+ 25 O&M)	30% Equity (15.9% Pvt, 1	Debt Repayment Guaran	12-Apr-16	FR, DR, ES, COS, COR (TOR), OMR, TR	8,856,298,066	3,189,883,169	720,000,000
4	GKBP	12.2 Km Bridge and 23.29 K	32 (7 Construction+ 25 O&M)	70% Debt 30% Equity (16% Pvt, 14% GoS)	Project Finance Facilility	28-Feb-25	FR, DR, ES, COS, COR (TOR), OMR, TR	30,500,000,000	17,000,000,000	8,500,000,000
5	Link Road	22.343 Km four-lane carriag	27 (2 Construction+ 25 O&M)	100% Pvt Equity	No Gurantee Given/ No (	NA	FR, DR, ES, COS, COR (TOR), OMR, TR	1,966,768,000	NA	NA
6	MEW P II	39.3 Km expressway	27.5 (2.25 Construction+ 25.25 O&M)	65% Commercial Debt, 35% Equity (20% Pvt, 15% GoS)	Debt Repayment Guaran	9-Mar-22	FR, DR, ES, COS, COR (TOR), OMR, TR	57,416,829,863	9,000,000,000	9,000,000,000
7	SNPC	2 X 50 MW Gas Power Plan	27 (2 Construction+ 25 O&M)	80% Debt, 20% Equity (10.2% Pvt, 9.8% GoS)	Collaterals / Lien (Cash +	4-Dec-23	FR, DR, ES, COS, COR (TOR), OMR, TR	12,417,160,000	7,453,530,079	7,453,530,079
8	NSV	Construction of pumping s	27 (2 Construction+ 25 O&M)	74% Debt, 26% Equity (Foreign Equity USD15mn, Mez. Debt USD10mn, Sub.Sukkuk Rs 2bn)	Debit Authority From Ac	22-Dec-23	FR, DR, ES, COS, COR (TOR), OMR, TR	69,100,000,000	27,350,000,000	27,350,000,000
9	Marble City	Industrial estate for Marbl	12 (2 Construction+ 10 O&M)	85% Customer Advances, 15% Equity (100% Pvt)	NA	NA	FR, DR, ES, COS, COR (TOR), OMR, TR	10,529,000,000	NA	NA
10	EMO Schools	81 SBEP Construction scho	10 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	17,530,271,590	NA	NA
11	TTIC Hussainabad	Improve the functioning o	11 Years (10M Installation 10Y O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	1,082,000,000	NA	NA
12	2 TTIS	Improve the functioning o	10 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	1,082,286,957	NA	NA
13	JICA Schools	Outsourcing of 19 public se	10 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	1,257,650,026	NA	NA
14	NICH	Fool proof security and fire	5 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	389,000,000	NA	NA
15	DHQ Badin	Hgh quality of service deliv	10 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	1,700,000,000	NA	NA
16	CHNK	High quality service delivery at 129 bedded facility	10 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	4,400,000,000	NA	NA
17	RBCs	4 state of the art Regional	10 Years (O&M)	NA	No Gurantee Given/ No (	NA	OMR, COR (TOR), TR	10,900,000,000	NA	NA
					-			**220,825,614,476**	**63,993,413,248**	**53,023,530,079**

FR	Financing Risk	COR (TOR)	Cost Overrun (Time Overrun)
DR	Demand Risk	OMR	O&M Risk
ES	Escalation Risk	TR	Termination Risk
COS	Change of Scope		

Table 21: Government Guarantees in PPP Projects completed

Sr. No	Project Name	Project Description	ppp Model	Contract Term	Project Cost	Capital Struture	Guarantee Type	Date on Guarantees were issued	Risk Coverage	Risk Coverage	Guarantee Amount/(Outstanding)
1	HMOs RHCs and THQs	61 RHCs, 3 THQs in Various Districts	O&M	Completed	191,381,100	No debt, No Equity	NA	NA	NA	NA	NA
2	HMOs DHQ, RHCs, BHUs	DHQ Khairpur, 3 RHCs, 29 BHUs Bin Qasim, Gadap Town	O&M	Completed	234,388,132	No debt, No Equity	NA	NA	NA	NA	NA
3	HMOs DHQ, RHCs, BHUs	1 DHQ Thatta, 8 RHCs, 4 THQs Thatta and Sujawal	O&M	Completed	826,000,000	No debt, No Equity	NA	NA	NA	NA	NA
4	Sindh Ambulance Service	30 Ambulance in District Thatta and Sujawal.	O&M	Completed	1,873,390,892	No debt, No Equity	NA	NA	NA	NA	NA
5	SMSP	medical/surgical supplies and consumables, maternal and new born child health initiative, primary health care referrals initiative, etc.	O&M	Completed	1,526,823,783	No debt, No Equity	NA	NA	NA	NA	NA
					4,651,983,907		-			-	-

Table 22: Capital Structure/Guarantees in planned projects

S.No	Project Name	Line Department	Project Cost	Capital Structure
Education Sector				
1	Non Formal Education	School Education and Literacy Department	NA	Under Development
2	Management & Operation of Public Sector Schools - MO	School Education and Literacy Department	NA	Under Development
Health Sector				
3	JPMC Security and Safety	Health Department	NA	Under Development
Transport Sector				
4	Yellow Line Project	Transport & Mass Transit Department	NA	Under Development
Water and Irrigation Sector				
5	TP1	Local Government & HTP Department	NA	Under Development
6	TP4	Local Government & HTP Department	NA	Under Development
7	5MGD Desalanation project	Local Government & HTP Department	NA	Under Development
8	Sukkur Water Distribution (USP)	Local Government & HTP Department	NA	Under Development
Industrial, Tech and Economic Zones and Ports				
9	NED Park	NED University	NA	NA
Parks and Recreation Sector				
10	Rani Baagh Development Project	Local Government & HTP Department	NA	Under Development
11	Shaheed Benazir Bhutto Park Project	Local Government & HTP Department	NA	Under Development
Forestation and Green Financing (Carbon Credits) Sector				
12	Carbon Reduction Project - Carbon Credits	Forest Department	NA	Under Development

3. WORK DONE IN THE QUARTER ENDED MARCH 2025

Table 23: List of Tasks Performed during the quarter

Project/Misc Work	Date	Document	Value Added
PSF Future Strategy (Risk Perspective)			
Strategy Document and Presentation finalized	2nd Jan/8th Jan 2025	Document and Presentation	Recap of project appraisals, emphasis on limits on PPP commitments, viable pipeline of projects
5 MGD Desalination Project shared with PPP U			
Input on RFP and Concession	January 7th, 2025	RFP and Concession	Calculated benchmark cost, breakeven tariff,
Exchange of info with ADB on checklists & EIA of 5 MGD Desal project shared	January 15th, 2025	REA/IRIP Checklists	Highlighted hydrodynamic conditions/advection-dispersion models to determine good diffusion effect, impact on ecosystems,
Guidance on setting KPIs for Desalination Projects,	January 20th 2025	Research Articles	considerations for intake structure design and General Specification (GS) outline for work such as membrane replacement
Meeting for finalizing responses for TFEC	11th Mar 2025	Word Document	Emphasized need cap for imported content but no floor, (machine imports)
Observations on 5 MGD Meeting (technical)	17th Mar 2024	Word Document	Shared KPIs/technical requirements for the 5 MGD Desalination Project.
Sukkur Water Distribution Project legal report			
Feedback legal report.	8th Jan 2025	Legal Report	Emphasized use of 2023 census data to estimate demand and alternative methods
Communication with ADB on RBC categorization	9th Jan 2025	E&S Checklists	UN requirements at 11-22 GPCD for water demand, water quality as per WHO, parameters and as per IS 10500:1991

Review on the legal and technical feasibility.	21st Jan 2025	Comment review matrix		Need for assessment of type of piping system, distribution network, no. of new connections, example of flow velocity of 0.5 to 2m/s for distribution mains and 0.3 to 1.5m/s for rising mains shared
Updated file on population calculation;	22nd Jan 2025	Excel File		Selection of projects on demand potential (last mile connections, WASH water, sanitation and hygiene indicators)
Provided input on EIA and E&S Checklist	23rd Jan 2025	EIA E&S Checklists -		Need for standardized sales agreements, with industrial/commercial users arranged with sub-project companies
Sindh Cities Improvement Investment Program T2 had similar scope,	24th Jan 2025	ESIA report		SFRDMA, stock of guarantees (including PPPs) not to exceed 25% of total revenue for preceding financial year
Feedback shared with PPP Unit	29th Jan 2025	Legal/Technical Comments Matrix		legal right to deny services to non-paying customers, subproject companies allowed to collect fees
Education Sector Projects - Concept Notes/Working Papers				
Route-Based Transport Facility for Elementary and Secondary Level Girls	8th Jan 2025	Concept Note/Working Paper		Calculations of cost per student, annual & life cycle cost, double shifts and single & double shifts by van and bus,
JICA Elementary Schools – Working Paper	8th Jan 2025	Concept Note/Working Paper		Highlighted legal limitation on amenities conversion, commercial objectives at odds with educational, limited scope and scale
Colleges Improvement Project-ADB Transaction Advisory	6th Jan 2025	Input on concept Note		Shared facilities assessment file made by the health department, to make comparative assessment
Meeting on the Projects, Sindh Solarization, SSIP, ECE for PPPB	20th Feb 2025	Concept Note/Working Paper		Emphasized stakeholder consultation and consideration of alternative
Semi Annual Environmental Monitoring Report (SAEMR)				

	Comments on SAEMR	20th Jan 2025	Word Document		State of readiness of sub- projects for ADB financing requirements, Screening Tools and GRM Highlighted
Letter to PPP-Node of SELD- delay annuity payments under EMO project					
	Draft letter to PPP-Node of SELD- delay annuity payments under EMOs.	21st Jan 2025	Letter		Delay in IE and IA certificates / Project Management Issues at PPP Node SELD
RBC Sukkur					
	PAR of RBC Sukkur shared with ADB	20th Jan 2025	PAR Document		Highlighted 3 HBBs not part of the contract, important indicators such as emergency blood releases without cross match
	Compiled stats for RBC Jamshoro to be adapted for RBC Sukkur	20th Jan 2025	Word Document		Issues related to QC and training and competencies of staff, lack of blood donation recruitment policy,
	Comments on the environmental audit report for RBC Sukkur.	30th Jan 2025	EAR Document		Planned Preventive Maintenance (PPM) records, Hemovigilance forms, not up to standards
	Responses and correspondence with ADB on RBC Sukkur queries	12th Mar 2025	Clarification documents		utilization of funds from capital accounts for operational purposes
Information on guarantees and termination liabilities of PPP projects in the VGF Guarantees Break-up file.					
	Meeting between DMO & Provincial Risk Units on CLs for PPPs	29th Jan 2025	format for reporting on CLs of PPPs		Information on guarantees and outstanding liabilities of PPP projects
	Shared output with PPP Unit, and DMO, MOF. GOP.	29th Jan 2025	Table of Info		Information on risk sharing structure in PPP Projects
Malir Expressway Phase-1 Project					
	Feedback on inception report. shared with PPP -U	17th Feb 2025	Inception Report		Highlighted concerns of LGD Dept, project alternatives, workings on financial model (breakeven/cost of construction w/km).

USP presentation, review	17th Feb 2025	Presentation		Payback period is 10.2 years; project term can be shorter
MRG Scenario reviewed	18th Mar 2025	MRG Scenario		Structured + triggered MRG > coverage amount
Comments on USP Preliminary Review Report	21st Feb/ 12th Mar 2025	Preliminary Review Report		Calculated revenue per vehicle from to fuel savings and carbon credits, Rs per km per trip also worked out
Categorization (REA and IR&IP)	21st Feb/6th Mar 2025	Checklists reviewed and shared		w/km for at grade section more than elevated section, route length savings did not factor in at grade project length
Communication with PPP-U to obtain E&S checklists	21st February, 2025	REA and IR&IP Checklists		Compensation for mangroves p.a. shared
Financial Model and Structure review	12th/26th Mar 2025	Financial Model		Highlighted requirement for EIA and LARP
Ghotki Kandhkot Bridge and MEW P2 Project History				
Reasons ADB dropped GTKC & MEW from consideration for funding	28th Feb 2025	Word Document		ADB review missions in 2022 concluded the projects were too advanced for ADB intervention/funding
Marble City Karachi Land opinion				
Review of Legal Opinion	5th Mar 2025	Email. Legal Opinion		Opinion did not directly address whether requirements highlighted for Marble City Project to ensure compliance are met.
Yellow Line BRT - Draft Feasibility Study - Volume I				
Feedback on Feasibility Study of Yellow Line shared with PPP-U	18th Mar 2025	Feasibility Study of Yellow Line		Accommodation of buses in depot according to formation, cycle time, consideration for insurance, surveys, hybridization ratio
Quarterly Performance Reports review of EMO Project				
PSF Observations on IE QPRs of EMO Project	27th Mar 2025	Word Document		Feedback on 9 quarterly reports by IE, lack of compliance on KPIs e.g. Lessons Plans not being implemented etc

Contractual Framework
The following is a summary of contractual framework as governed by FIDIC. FIDIC contracts are standardized international contracts used in the construction and engineering industries, developed by the International Federation of Consulting Engineers (FIDIC). They aim to provide a balanced approach to roles and responsibilities, risk allocation, and contract management.

Features of a good contract

Construction documents (CDs) are instruments of communication: Comprising legal, procedural, and construction information. It is important to understand that once a contract between owner and contractor has been executed, the construction drawings acquire the status of legal documents: They are instruments of the contract, as well as the focal point of the construction process. Errors, conflicting information, or omissions in these legal documents can result in costly change orders and should be avoided if at all possible.

Following the definition of the overall design in the design development phase and its approval by the owner, construction documentation is a natural continuation of the design process In a combination of written and graphic formats, construction documents translate the design of a project from the realm of ideas to physical form. They describe, in detail, the components of a project that need to be fabricated and assembled in order for it to be built. Construction documents are prepared at a more focused, detailed scale than either the schematic design or design development phases of a project. Construction documents typically include the following types of information:

- Contract forms (form of agreement between owner and contractor; forms for payment bonds and certificates)
- Contract modifications (e.g., additions or changes after the contract is signed, such as orders for minor changes in the work, construction change directives, and change orders)
- Information available to bidders (e.g., surveys, borings, drawings of existing conditions)
- Contract conditions (general conditions of the contract for construction, which outline the rights, responsibilities, and duties of owner, architect, and contractor, as well as others involved in the construction process, and supplementary conditions particular to the project)

Based on practical experience of different situations faced during contract implementations and theoretical principles of requirements of a good contract, the essential features of a good contract for successful completion of a project: Clear scope of work Clear banking, payments and insurance provisions.

Fundamental principles for drafting the scope of the contract

Scope of the project should be specific and clear in the contract, including but not limited to the following:

a) Scope of design and engineering.
b) Scope of supply of all equipment, machines, materials, tools, tackles, civil, spares, commissioning spares, etc., required to be supplied for completion of the project.
c) Scope of all services and utilities, transportation, storage, port clearance, customs duty payment, handling, insurances, testing, erection, pre-commissioning, commissioning, defect liabilities, training, supervision, dismantling, demolition of plant, equipment & building, etc.

Form of FIDIC Contracts

FIDIC offers standard forms of contracts widely used in international construction projects. PEC, the Pakistan Engineering Council, has developed its own standard bidding documents, incorporating FIDIC principles and adapting them to the local context.

Structure of the 1999 FIDIC contracts includes essential documents to form part of a FIDIC Contract

•General Conditions (of Contract) (This is always the relevant part of the FIDIC book chosen) ►

Particular Conditions (of Contract) (Include modifications and supplements to the GC as necessary due to the legislation of the Country and as a result of the Project)

Interpretation of the contract and order of precedence

Whenever there is a conflict on any issue, between the provisions of the General Conditions of Contract (GCC) and Special Conditions of Contract (SCC), the provisions contained in the SCC will prevail. Further, the interpretation of the contract should be followed as per the order of precedence of the documents as per the following, if any of these documents form part of the contract:

a) Contract Agreement along with the appendices
b) Technical Specifications in the contract
c) General Technical Specifications provided in the contract

In contract preparation choose the most suitable conditions of contract according to according to relevant questions such as is the subject / type of the contract (construction only or is the contractor is involved also in the design)

Clause 1 (General) comprise 20 Clauses and covers foundational aspects such as contract language. , covering similar subject matter in all three contracts, Sub-clauses within Clause 1 further specify details about the contract's scope, definitions, and other general provisions – such as: commencement of works, management of time, programming, payment procedures, Measurement

of Works (or otherwise), testing and commissioning , management of variations, adjustments, procedures for claims, handling and resolution of disputes.

The contract documents should also include technical specifications – drawings, method of measurement and employer's requirements i.e. schedule of lump sum prices and their breakdown procedures for typical situations appearing in construction/engineering contracts

FIDIC contracts, like the Red Book, require the contractor to submit a work program (often referred to as a planning package) to the Engineer. This program is a schedule of the project's activities, including milestones and timelines. According to Clause 8.3 of FIDIC Red Book 2017, the contractor has to submit the work program (usually a planning package) to the Engineer within 28 days of receiving the Notice to Commence from the Engineer and the Engineer has to give notice to the contractor within 21 days after receiving the initial program, stating any comments on the submitted work program.

Price schedule in the contract

A detailed price schedule has to be provided for all the items to be supplied under the contract. The price schedule should be provided for all the items to be supplied by each party, including but not limited to the following:

a) Indigenous and imported supplies, technological structures, fabricated building structures, steel, and all the items which form a part of the scope of work.
b) Civil engineering works and supplies.
c) Storage, handling, erection, commissioning and performance guarantee.
d) Services, transportation, sea freight.
e) Custom clearance and supervision.
f) Engineering and design.
g) All the items/activities which are the part of the EPC project.
h) All the items which are unique and specific to a particular project either from supply, erection and services.

All appropriate, applicable taxes and duties (including the statutory taxes) should specifically be indicated in the price schedule. Provision for price adjustment due to variation in price indices should also be included in the contract.

Time schedule

Though the contract provides the schedule for overall completion of the project, however, to bring more clarity and to bind the contractors, the sub-schedule of various activities of engineering, procurement and commissioning should be provided in the contract.

A project has different types of project schedules that are used for different purposes by contractors as well as the employer.

L1 Schedule summarizes the project schedule and is also referred to as the Project Schedule ('PM'). It highlights the major project schedules, milestones and key deliverables.

L2 Schedule: is also referred to as the Summary Master Schedule (SMS). This is used for overall control of the project and is treated as an important schedule to monitor the project. L2 is the master schedule and is very important to indicate all major activities on a critical path. Any delay of the project is reflected in the L2 revised schedule, which determines the amount of delay in the project. L2 schedule is normally a part of the contract or agreed and signed by all the stakeholders of the project just after signing the contract and before the commencement of the work.

L3 Schedule: This schedule indicates the integrated Critical Path Method (CPM) overview of the project. Many contractors follow this schedule for monitoring and controlling the project.

The contractor uses it for engineering, procurement, construction, and commissioning purposes. This schedule also defines the overall critical path for the project.

L4 schedule: This schedule is also known as the project working schedule where each schedule is expanded and followed. This also indicates the 'work ahead' situation on a short-term basis in the project.

L5 schedule: It is a short-term schedule for a specific area having detailed activities to be coordinated on a day-to-day basis.

Retention Money

FIDIC contracts also have clauses related to payment procedures, which indirectly relate to scheduling and progress monitoring. For example, should the next payment certification be contingent on the contractor providing a submittal schedule?

Retention money is the amount of money retained by the employer out of the running invoices. The percentage of money of the contractors retained by the employer and the conditions for its release are also provided in the contract in very clear terms which may vary from one contract to another. Normally, 12.5% value of each item of billing schedule is retained, which is released in the form of milestone payments as per the contract. Such milestone payments are made only when the employer is fully satisfied with the achievements and performance of milestones as per the detailed criteria mentioned in the contract.

Negligence

A provision dealing with negligence is also provided in an EPC contract. It is a very strong tool in the hands of an employer to be used in case of any negligence by the contractor in the project. If the contractor is found neglecting the execution of facilities, then the employer may revoke or cancel the contract holding the contractor fully liable for the damages sustained by the employer.

Design and Construction Process

This write-up focuses on *procedures and the documentation that is required in the design process of civil engineering works*. Emphasis is placed on checking and certification, to ensure that designs are performed and recorded properly.

Every project has distinctive characteristics that demand unique expression. Nonetheless, each requires its project manager to revisit the industry-wide standards for assembling construction Documents (CDs). The heart of any project resides in its construction drawings and specifications. This is the place where the building succeeds or fails: **drawings are the means by which it is determined if the contractor's interpretation of the design concept is acceptable**. Therefore, a thoroughly documented, **meticulously coordinated set of construction drawings and specifications** that clearly and faithfully communicate the project design while **enabling construction to proceed within budget and on schedule is required.** The most traumatic contract change for the architect is one that is caused by an error or omission in the drawings.

The basic aim is to produce a design that can perform the intended functions throughout design life, environmentally acceptable, both during construction and in the long term. For example, a design criterion for hydraulic capacity of duty pump is that it should be capable of handling runoff arising from rainstorms of 10 years return period. Likewise, a through a review of the project's construction documents will present key design opportunities to revise the design and make it eligible for LEED certification.

Design

The design of a project involves formulation of a conceptual design, identification of suitable alternatives, selection of a preferred basic scheme, design calculations, and drawings. A properly planned site investigation to identify the geotechnical problems of a site and provide sufficient data for safe and economic design and construction is also needed. At least four months lead time should be planned for major ground investigations.

At the preliminary design stage, comparisons of the order of costs should be made for alternative schemes to select the most suitable scheme. The purpose of an order of cost estimate is to establish a realistic cost limit/ maximum expenditure for a project. This is done by applying average unit costs per square foot, cubic foot, or other relevant metrics to estimate materials and labor. Indirect expenses like permits, insurance, and overhead are factored in and a buffer is added for unforeseen issues and cost fluctuations. This provides a range estimate indicating the project's potential cost.

Design Calculations

Design calculations often use established equations and formulas to predict the behaviour of a component or system, for example calculating the required thickness of a steel beam or determining the diameter of a pipe. The design calculations include structural, performance,

loading , mechanical, thermal, and fluid dynamic calculations. They are crucial for supporting the selection of components and materials and ensuring the design's integrity. Calculations can be performed by hand, using spreadsheets, or through specialized software. A design calculation file is opened and design calculations prepared; and then arithmetical checks on design calculations are carried out. The project engineer should ensure that the design has been correctly translated onto drawings, i.e. the details correspond with design assumptions, philosophies and calculations.

There shall be an estimate description for each works package at its relevant Category of Cost of the project. Each estimate shall be comprehensive and cover all costs including consultant's fees, site investigations, laboratory testing, resident site staff, supervision, construction works and contingency. (Please see Annexure 5).

Drawings

Design drawings in infrastructure are detailed plans and diagrams that visually communicate the design of a project like a road, bridge, or building. They serve as a blueprint for construction, help estimate costs and resources allow to obtain necessary permits, ensuring the project is built according to the design intent. In the construction drawings, it is **possible to express the possibilities of materials, the lyricism of their assembly, and the potential of each to articulate and support the ideas of the larger whole**. **Drawings are tested, explored, and depicted to ensure it will be constructed correctly on the site.**

Drawing Scale

Mock-up drawings (i.e., cartooning) can inform the creation and organization of a construction drawing set. The mock-up set should include all the **drawings required for a comprehensive description of the design intent of a project,** including drawings for all the relevant disciplines and specializations. A set of drawings should comprise at least eight to ten architectural sheets, plus the consultant's sheets and drawings from related disciplines such as mechanical, electrical, plumbing, and civil engineering and landscape design.

Determine the most appropriate scale for executing and understanding each drawing, and plan how the drawings should be laid out on each sheet and within the set. Proficiency is needed in describing projects graphically at a range of scales— from context and site plans to detailed floor plans, sections, elevations, perspectives, axonometric and digital models—Axonometric is a drawing technique that creates a two-dimensional image of a three-dimensional object.

The desirable scales for the drawings depend on the nature and complexity of the works. Divisions/offices should have standardized scales, which should be chosen for the particular types of drawings to communicate information clearly and accurately. For example, enlargements of sections of the floor plan might be presented at 1/4″=1′-0″. represents the scale of the drawing. It indicates that one-quarter of an inch on the drawing corresponds to one foot in actual size.

Construction details, because they show a great deal of information about a very small element, might be presented at 1-1/2″=1’0″ or even larger.

Tools for Drawing Production

In the construction industry, spatial visualization and modeling involve creating and manipulating digital representations of infrastructure projects to aid in design, planning, and management. This includes using 3D models, simulations, and visualizations to understand the project's layout, functionality, and potential impacts

As a result of significant advances in the capabilities of computer drawing programs, as well as the widespread adoption of computer drafting by the construction industry, the manual production of construction drawings has become increasingly rare. Notwithstanding, some firms continue to produce construction drawings by hand (Freehand drawing and design sketching), primarily using ink and plastic lead on pre-cut sheets of Mylar

Scale drawings are used to communicate the dimensions of a full-size project on a paper or electronic document. The selected scale is usually in the title block in the lower-right corner of the drawing but may be located anywhere on the plans. Drawings can be inaccurate due to any form of copying or processing. For Drawings, A3 size or larger is recommended for best reading comfort. Standards of drawings for projects should conform to the requirements of the Computer-Aided-Drafting (CAD). In the CAD environment, the scale at which the drawings will be plotted must be taken into consideration so the line weight and text size for drawing annotations appear in the correct size on the plotted sheets. There is a need to establish the file format in which drawings will be submitted, reproduced, and archived (e.g., AutoCAD .DWG, .PLT or Adobe .PDF). Typical advantages of using CAD technology include the ability to: Copy, mirror, and array repetitive elements very quickly, Scale drawings simply, Make drawing changes and revisions quickly,

Design and Check Certificate

In the context of construction drawings, a **"green-light check set" refers to a specific set of documents that are approved and finalized for construction purposes**. This set is given the "green light" because it signifies that **all necessary approvals and revisions have been completed**, allowing the project to proceed to the construction phase. It's essentially a final, validated set of plans that contractors can use to build the project.

The potential for and severity of professional liability for errors and omissions are often tied to when they are discovered. An error discovered during the bidding phase can be corrected with an addendum to the construction documents, as the owner has not yet entered into a contractual relationship with the contractor, corrections to errors at this point typically involve limited costs to the project or its consultants.

For projects employing consultants for planning and design, the **consultants shall report in the monthly progress meetings the status of design checking** to enable the project office to be informed of the progress of the design checking.

The objective of the independent checking is to ensure:

a) compliance of the design with the relevant design standards and statutory requirements.
b) validity of design concepts, methods and assumptions.
c) applicability, accuracy and validity of computer programs and models used in the design.
d) accurate translation of the design into drawings and specifications.

Checking Engineer is given drawings of the works as designed, the design memorandum, other information on functional/performance requirements and applicable design standards of the works, but without the design calculations. The checking Engineer then verifies the design as shown on drawings by executing an independent set of calculations.

When the design checking has been completed and all necessary amendments to the design calculations, specifications and drawings have been made and checked by the Checking Engineer, the Designer and the Checking Engineer **shall sign the "Design and Check Certificate**" The Designer shall exercise every effort to ensure that no drawings shall be issued for tendering or construction until the "Design and Check Certificate" has been accepted by the project office. The **certification guarantees design has been accurately translated into contract drawings** and the design and amendments of design complied with the relevant standards at the time when they were carried out and an in-house independent check has been undertaken and completed to confirm that they are complete, adequate, and valid, and all conditions for checking **procedures in relation to the design and amendments of design have been complied with.**

The design certification should entail language such as the following.

- design has been prepared in compliance with the standards set out in the design memorandum of the contract, civil engineering/technical manuals, technical circulars practice notes and relevant codes of practices, standards,
- Confirm that the design/stability assessment of the geotechnical features included in the certificate of design and completion/stability **assessment of geotechnical features has been found to be satisfactory.**
- Certify that checker has exercised all reasonable skill and care to be expected of a professionally qualified and competent person, experienced in work of a similar nature and scope, in the performance of duties relating to the preparation, review, checking and certification of the design and amendments of design of the geotechnical features.
- The design and amendments of design have been conveyed accurately and completely to the Engineer for the Contract for Execution.

Construction Phase

The increasingly common production of schematics, design development, and construction drawings in the CAD environment has resulted in a greater carryover of drawing information from design development into the Construction Document (CD) phase. Like all other stages of project development, construction drawings and specifications are typically issued for checking and coordination at major contract milestone intervals (e.g., 30 percent completion, 60 percent completion, 90 percent completion, 100 percent completion, issued for permit, issued for bid, issued for construction), as well as when any construction document changes are issued as addenda or bulletins.

Design calculations, records and drawings should be revised and updated as the need arises. Major design revisions should be checked in the same manner as the original design. Amendments of design including site instructions etc. with geotechnical significance should also be included in the record and be accurately and completely conveyed for execution on site. Amendments of design which are geotechnically significant are those which would affect the validity of the design which was previously checked, or entail a significant change in the location, extent or form of the features or a significant change of factor of safety or in the risk posed by the features. Examples include siting a development on previously vacant land close to a feature etc.

There should be a review the documents to determine which drawing sheets are affected by such a discrepancy. All drawings that need to be updated are redlined. Are there any new drawings that need to be added to set of construction documents to make them complete? Affected sheets I should be listed. It is important to weigh the necessity to meet project deadlines against the need to revise multiple drawings to meet the code requirements. Can an alternative approach be devised to accomplish the necessary changes without affecting project schedule or opening the firm to liability

Submittals

Contractor initially submits the project schedule to the consultant for review. The contractor incorporates the consultant's comments and revises the schedule accordingly. This approved version of the schedule is known as the baseline schedule. It serves as a reference point for comparison throughout the project's life cycle.

A submittal schedule outlines the timeline and sequence for submitting and approving materials, products, and equipment for a construction project. It acts as a roadmap, ensuring all necessary items are submitted, reviewed, and approved according to the project's specifications. A group of activities within the Critical Path Method (CPM) Schedule track all submittals through their progression of preparation by the Contractor and approval by the Owner and how they affect the construction progress. Projected cost and earned Value figures are calculated on more realistic dates of when the Material and/or Equipment will be delivered to the Project Sit

Change Orders

The following is a recap of causes for change of scope, i.e. change orders that result in cost overruns. It outlines ways in which change orders may be contained. It is based upon a study by INDOT (Indiana Department of Transportation).

A commonality among government departments is the inability to complete projects on time and within budget. As the construction program grows this can cause planning and budgeting problems. Money had to be set aside and creates scheduling problems for determining what projects cannot be let. Therefore, there is a need for a reduction in overhead costs and an increase in the efficiency of the capital program expenditure.

For these and other reasons, INDOT undertook a study to analyze the extent of the cost overrun and time delay problem and to make appropriate recommendations. When a large percentage of contracts have overruns, it indicates the extent (or frequency) of the problem. When the total overrun is high (in percentage), it indicates the severity of the problem.

Documents for Changes in the Work

Generally, the primary reasons for actual costs varying from a contractor's original bid price are changes in the scope of the work to be done and incorrect estimates of the work quantities included in the original bid specifications. Contractor errors include unnecessary work, work that is not according to design plans, and work or materials that do not meet contract specifications. On the other hand, contracting agency errors include planning and design deficiencies such as revisions in the scope of the work, added work, and revisions in quantities in the project design. Unforeseen circumstances include site conditions that differ from those described in the contract documents.

Change Orders

CDs are legal documents that become part of the contract between the owner and the contractor. Errors, conflicting information, or omissions in these legal documents can result in costly change orders and should be avoided if possible. Change orders (Annexure 3) are classified as preventable or non-preventable. In the US State of Indiana, there is clear definition of what constitutes a preventable or non-preventable change order [INDOT, 2002]. **Preventable change orders include those due to errors and omissions in contract documents, constructability problems, and changes in scope of the project**. On the other hand, non-preventable change orders are those associated with changed field conditions, failed materials, incentive/disincentive provisions, and changes or updates to standards/specifications. A properly planned site investigation to identify the geotechnical problems of a site and provide sufficient data for safe and economic design and construction is needed. At least four months lead time should be planned for major ground investigations.

A change order can imply extra or additional work, which are essentially two different concepts: extra work may not be necessary for project completion and can be independent of the contract.

Additional work may be necessary because of errors or a change of plans and specifications. The major causes of overruns in percentage of annual net overrun amount were identified as follows: Extra work (40%), Traffic control modifications (6%), Design oversight (16%) Miscellaneous adjustment to bid quantities (6%), Incentive/disincentive payments (21%) Claim settlements (6%).

With regard to remedial measures, there are three types of delay (Rowland, 1981): **Excusable delay: the contractor is given a time extension but no additional money.** Concurrent delay: neither party recovers any damages. Compensable delay: the contractor recovers monetary damages.

The price of a change order can be expressed as a lump sum, a unit price, or the cost plus a fee, which needs to be documented, estimated in terms of price and delay, and approved by both parties. A change order is just as legally binding as the original construction contract.

Audit Reports

In a study by the Office of Program Policy Analysis and Government Accountability that investigated the problem of cost overruns in the State of Florida. $15.6 million of the $28.6 million of cost overruns were considered "avoidable" costs. Furthermore, approximately $4.2 million of the avoidable costs were considered wasted money because they did not add value for citizens. The Florida study sought to identify the responsibility for such "wasted money,". It was found that consultants and third parties in the Florida study were responsible for more avoidable cost overruns (38% for both) than agency staff (24%), but the part of cost overruns that do not add value to the project was less for consultants than for agency staff.

Minimize Cost Overruns from Change Order

In a bid to minimize cost overruns from occurring and to hold responsible parties accountable, Turcotte (1996) made recommendations for the Office for Program Policy Analysis and Government Accountability in Florida. (Please see Annexure 4).

The problem of change orders needs to be addressed at source. Most bidding documents (with the exception of those for resurfacing projects) are prepared by consultants A standard report for each consultant and for each contract could be prepared and provided to such consultants to point out errors committed and how such errors may be avoided in future. It was recommended that INDOT should design an annual report that reviews the performance of consultants. Such a report would assign "grades" to each consultant, taking into account the number and dollar amount of preventable change orders that are attributable to the consultant.

Finally, it is recommended to develop a system that would facilitate communication of updated information concerning cost overruns, time delays, and change orders, to the general public. As has been done in some states (ADOT, 2003) and illustrated in Appendix G, this could be implemented using an electronic tool that could be made available on the internet.

Quantifying Cost Overruns

This write up is based on the paper with the title "The Cost Drivers of Infrastructure Projects: Definition, Classification, and Conceptualization", published by White Rose Research Online (WRRO), which is the jointly managed repository for research produced by the Universities of Leeds, Sheffield and York. It provides a quantification of risk as measured against control and compliance levels in a project.

The stated paper talks about identifying specific actions that project teams can take to reduce costs. It focuses on cost drivers, which project team members can actually reduce, i.e., controllable cost drivers For the control dimension, the project team itself has the ability to reduce the cost impact associated with the cost driver.

The central scope of a project.

The baseline acts as a benchmark to assess the project's actual progress. If the project deviates (either over or under budget, or ahead/behind schedule), adjustments or corrective actions can be made. Any changes in scope, cost, or schedule that arise during the project need to be evaluated against the baseline.

Project planning and cost reduction strategies.

The process of identifying all the activities necessary to successfully complete a project is called project planning. Each activity in a project is a discrete task. One of the most important steps in planning a project is estimating the time required to complete each activity. The duration of each activity is a function of quantity of work and work production rate. When, for instance the project bid estimate is prepared, the estimator calculates the quantity of material that must be put in place and assumes a production rate to get the cost of each work.

Inaccurate time estimates can result in unrealistic schedule, and can result in inefficient use of resources and late delivery. Inaccurate cost estimates can result in insufficient budget being allocated, or excess budget being set aside for the project when it could be used for other projects. If the cost or benefits estimates are inaccurate this can lead to incorrect decisions about proceeding with the project being made.

To be able to perform an accurate estimate of the project targets it is very pertinent to divide project into manageable sets of components or activities called Work Breakdown Structure (WBS) of the project. WBS is a preliminary document that provides the basis for planning and managing project schedules, costs and resources.

The number of activities in WBS grows quite rapidly and it is not unusual that a large construction project is broken down into several hundreds of activities. A work package is a task at the lowest level of the WBS. It is generally the case that the WBS is poorly detailed rather than too detailed. According to Jackson (2004) the level of detail should correlate with the control level desired, i.e. to have enough activities and just the right amount of detail so that the work-flow effectively can be monitored and managed.

In construction, a schedule of values (SOV) is an itemized list that breaks down the total contract amount into smaller, manageable portions, each corresponding to a specific phase or section of work. It essentially maps out the estimated cost for each element of the project and helps track progress and payments.

Network analysis system (CPM):

This is the schematic representation of various activities. This method calculates the longest overall duration for the sequenced activities for a project along with start and finish time of project activities.

Tasks A, B, C and D all take 5 days. A must be before B and C can start. D is the final task B and C can be run in parallel after A. The Network Diagram is: A --> B/C --->D. The critical path is 15 days, not 20, because B and C can be done simultaneously (Afer A)

The elements of planning described above relate to the control dimension, whilst the following relates to the compliance dimension. That is, as opposed to techniques for scheduling, EVM is a project performance measurement technique. Given a baseline (original plan plus approved changes), you can determine how well the project is meeting its goals.

Earned Value Management System (EVMS):

EVMS is a management tool which is used to ascertain project status, i.e. the state of previous work accomplished against where the project was planned to be. It is an early warning system to detect deficient or endangered progress.

EVMS is directly tied to the baseline because it helps monitor the project's adherence to the original plan (the baseline) by tracking and comparing Earned Value to Planned Value and Actual Cost.

The baseline includes the Planned Value (PV) which is the budgeted cost of the work planned to be completed by a specific point in time (based on the schedule baseline).

As the project progresses, actual performance is tracked: Actual Cost (AC) is the parameter that measures actual expenses incurred for the work completed by a specific time. Earned Value (EV) is the value of the work actually completed, expressed in terms of the original budget (also referred to as the "earned" portion of the project). EVMS compares the Earned Value (EV) against the Planned Value (PV) to see if the project is ahead or behind schedule, and compares EV to Actual Cost (AC) to evaluate whether the project is within budget.

Scheduled Variance (SV) and Cost Variance (CV) give insight into the project's health in terms of time (schedule) and cost. They indicate whether the project is performing according to the plan (baseline) or deviating from it.

Schedule Variance (SV) = EV - PV: If EV is greater than PV, the project is ahead of schedule. If EV is less, it's behind schedule.

Cost Variance (CV) = EV - AC: If EV is greater than AC, the project is under budget. If EV is less, it's over budget.

EVMS uses these comparisons to derive performance indices:

Cost Performance Index (CPI): EV / AC – Measures cost efficiency.

Schedule Performance Index (SPI): EV / PV – Measures schedule efficiency.

These indices and variances provide insights into how well the project is performing relative to the baseline and help in making data-driven decisions on corrective actions, if necessary. CPI (Cost Performance Index) and SPI (Schedule Performance Index) can be linked to the level of control and compliance in projects, as they provide critical insights into the project's efficiency in terms of both cost and schedule.

CPI → Level of Control Over Costs: Since CPI is focused on tracking and controlling costs, it directly correlates to the level of control a project manager has over financial resources. A strong CPI indicates that the project manager is maintaining effective control over spending and cost overruns.

SPI → Level of Compliance to Schedule: SPI is more aligned with how well the project is staying on track with the original schedule. A higher SPI indicates better compliance to the schedule, while a lower SPI suggests the project may not be meeting the set deadlines, requiring corrective measures to restore schedule compliance.

What is risk?

Risk is viewed as a measure of the likelihood of an event occurring multiplied by its impact. For example in tech businesses, technology risk is governed by one equation: Risk = Likelihood x Impact.? In order to improve the definition of risk it can be linked parameters of frequency, control and compliance. For example, probability may be perceived to be linked to the level of control, since probability in part relates to the external influences that may be outside the control of the entity excising such control. (Annexure 7).

In an audit context, compliance and control represent two parts of a successful process. Control is the part of the process designed to accomplish a goal, i.e. a control is a set of procedures that are put into place to address risks. Compliance is the execution of the process that was designed.

Practical Example: Linking to a Project

Suppose a project is being managed, and the probability of cost overruns (hazard rate) is determined using historical data, which is based on different sample sizes. The goal is to link the probability to an accurate forecast of project costs and budget. For a project cost of Rs 1,000,000, using different sample sizes affects the forecast of contingency. (Annexure 6)

Applying All Techniques Together in the Bridge Project

By integrating CPM, PERT, Lean Construction, Six Sigma, CCPM, Value Engineering, TQM, and other techniques, the project can benefit from enhanced performance, reduced cost overruns, and higher quality. Each of these techniques complements the others, creating a synergistic effect that helps the project run more smoothly and efficiently. For example: CPM and CCPM help you track and optimize the project's timeline, identifying and mitigating delays early. Lean Construction and Six Sigma ensure resources are used efficiently, reducing waste and improving quality. EVM keeps you aligned with budget and schedule targets, while TQM [15]ensures that every stage of the project meets the highest quality standards. Value Engineering ensures that you are getting the best value for the cost, and Design Thinking ensures the project is meeting the needs of the end-users.

By using all these techniques in concert, you will have a well-rounded, effective approach to managing the Rs construction project, leading to better outcomes in terms of schedule, cost, quality, and stakeholder satisfaction.

[15] Total Quality Management

ANNEXURE 1: LIST OF PROJECTS COVERED BY PSF

S.No	Project Name	Line Department	Projects Reviewed in Prefeasibility Stage	Projects Reviewed in feasibility Stage	Projects Reviewed During Bidding	Projects Reviewed in Implementation phase
			The first cell highlighted in blue marks the stage the project was first received			
Education Sector						
1	EMOS 1-4	SELD				1
2	EMOS 5-6	SELD		1	1	2
3	EMO 7 -8	SELD	1	2	2	3
4	Teachers Training Institute Hussinabad	SELD				4
5	Teachers Training Institute (3 Institutes)	SELD		3	3	5
6	Non Formal Education	SELD	2	4		
7	JICA Girls School	SELD		5	4	
8	Four Public Schools Project	SELD		6		
9	Sindh Secondary Education Improvement Project (SSEIP)	SELD	3			
10	Provision of Free Transport to the Girls Students of Grade 9-12 in Selected Districts	SELD	4			
11	Solarization of Schools	SELD	5			
Health Sector						
12	Regional Blood Bank Jamshoro	Health				6
13	Regional Blood Bank Sukkur	Health				7
14	JPMC Security and Safety Contract	Health		7	5	
15	NICH Security and Safety	Health		8	6	
16	Health Management Organisations	Health		9		
17	Drugs Adddiction Treatment Centre Project	Social Welfare Department	6			
Roads and Motorways Sector						
18	MEW	LGD		10	7	8
19	GKBP	W&S				9
20	URI Mauripur	LGD		11	8	
21	URI Korangi	LGD		12	9	
22	Link Road Project	W&S		13	10	10
23	Karachi Thatta Dual Carrigeway	W&S				11
24	TMK to Sajwal Hyd to TMD	Works & Services		14		
Water and Irrigation Sector						
25	Hub Canal	KWSB		15	11	
26	TP1	KWSB		16	12	
27	TP4	KWSB		17		
28	5MGD Desalanation project	KWSB	7	18	13	
29	Sukkur Water Distribution (USP)	LGD	8			
30	Nabisar Vajihar Water Supply Project	Water Supply				12
31	65 MIGD Water Project	KWSB	9	19		
32	Karachi Bulk Water Supply Project	LGD	10			
33	Lyari Sewage Rehabilitation Project	LGD	11			
34	North Western Canal Project	Irrigation Department		20		
Industrial, Tech and Economic Zones and Ports						
35	Marble City	Investment Dept			14	
36	Khairpur Special Economic Zone Project	Investment Dept				13
37	NED Park	NED University	12	21	15	
38	Keti-Bander Project	W&S/Energy		22		
39	Dhabeji Industrial Zone			23	16	
Parks and Recreation Sector						
40	Rani Baagh Development Project	LGD		24		
41	Shaheed Benazir Bhutto Park Project	Karachi Development Authority		25		
42	Outsourcing of Existing Recreational Facilities	Sindh Tourism Development Corporation	13			
Transport Sector						
43	Yellow Line Bus Operations Project	Transport & Mass Transit Department	14			
Real Estate and Housing Sector						
44	Lyari Development Housing Scheme 42 Project (Lyari)	Sindh Civil Servants Housing Foundation	15			
45	Sindh Civil Servents Housing Foundation (Malir)	Sindh Civil Servants Housing Foundation	16			
46	Carbon Reduction Project - Carbon Credits	Forest Department	17			
	Total Project Reviews			17 + 25 + 16 + 13		71

ANNEXURE 2: LIST OF PARS MADE BY PSF

S.No	Project Name	PARs Made	PARs Approved	PARs Funded
Education Sector				
1	EMOs RFP 1-2	1	1	1
2	EMO RFP 3	2	2	2
3	EMO RFP 4	3	3	3
4	EMO RFP 5	4	4	4
5	EMO RFP 7	5	5	5
6	Teachers Training Institute Hussinabad	6		
7	Teachers Training Institute (3 Institutes)	7	6	
8	JICA Girls School	8	7	
Health Sector				
9	Regional Blood Bank Jamshoro	9	8	6
10	Regional Blood Bank Sukkur	10	9	
11	JPMC Security and Safety Contract	11	10	
12	NICH Security and Safety	12		
Roads and Motorways Sector				
13	MEW	13	11	
14	GKBP	14	12	
15	URI Mauripur	15	13	
16	Link Road Project	16		
17	Karachi Thatta Dual Carrigeway	17		
Water and Irrigation Sector				
18	Hub Canal	18	14	
19	TP1	19	15	
Industrial, Tech and Economic Zones and Ports				
20	Marble City	20		
21	NED Park	21	16	

ANNEXURE 3: CHANGE ORDER CLASSIFICATION CODE

INDOT, 2002			
Code	Reason type	Name	Description
101	Errors & Omissions Contract Document	Contract related	Most usually, INDOT's responsibility. For example, delay in the "Notice to proceed" can result in extending the contract
102		Design related	Designer's bust - something wrong or left out. For example, wrong elevation on bridge caps; or a mess in clear zone alignment, etc.
103		Environmental related	Example: Hazardous materials not designated on plans, or buried fuel tanks not identified
104		Materials related	Materials are either designated incorrectly or left out. Example: Leaving out top mat of reinforcing steel in a bridge deck.
105		Permits	Example: Permits not current – or not obtained, causing delay of contract.
106		Quantity related	Probably the most criticized segment of contract documents errors. Quantities are critical for construction – both INDOT and contractors' errors and omissions can lead to unbalanced bidding by contractors anticipating the necessary change orders. Can also necessitate time extensions to the contract.
107		R/W Related	When INDOT does not have all Right of Way cleared, this can cause

			a change in the contractors' sequence of construction, leading to time extensions and additional costs.
108		Soils related	Example: Unsuitable material requires the substitution of suitable materials at increased negotiated cost.
109		Staging Related	The sequencing construction operations must not interfere with the other public or private considerations.
206		Soils related	Example: Improperly designated peat bog required excessive undercutting and replacement with special materials.
701	Standards/ Specifications Update or Changes	Contract completion time	It should only be used if a specification change would increase or decrease contract time requirements.
702		Contract payments	It should be used whenever the specifications that apply to the contract state different payment procedures than those stated in the Schedule of Pay Items.

ANNEXURE 4: RECOMMENDATIONS FOR ADDRESSING COST OVERRUNS AT DELDOT

No.	Recommendations
1	Completion of the development of the bid analysis system.
2	Completion of all aspects of the Project Payment Tracking System so that management has comprehensive, reliable information regarding change orders.
3	Revision of contracts to allow the State to recover additional costs incurred as a result of errors and omissions of consultants.
4	Continued establishment procedures that will ensure more accurate contract design quantities which will provide better engineer estimates of costs before the project goes out to bid.
5	Continued formal tracking both preliminary design requests and input from plan reviewers. The plan reviewers should be held accountable for non-compliance review deadlines.
6	Continued implementation of a formal budgetary control process which ensures that each change order is afforded an appropriate level of management review.
7	Review of post construction contract review process to ensure that its stated objective of decreasing plan revisions, change orders, and construction claims is attained and resulting improvements to contract economy and efficiency are documented.
8	Completion of contractor evaluations and use as part of the pre-award evaluation process.
9	Implementation of a plan to ensure that highway construction contracts are afforded sufficient audit coverage.
10	Development of additional performance measures to provide management with more comprehensive data to assess performance.
11	Ensuring that DelDOT processes provide appropriate reporting of performance measurement, such as, consistent reporting periods.
12	Update of DelDOT's Highway Construction Manual and the Contract Administration Procedures Manual.

ANNEXURE 5: ESTIMATING SCHEDULE

The project estimate is usually first prepared in the TFS for the project's inclusion in Cat C and thereafter shall be formally reviewed and revised as described in the following table

ESTIMATING SCHEDULE	
FUNDING STAGE	ESTIMATING REQUIREMENT
Cat C	The project estimate should be revised whenever information affecting costs becomes available (e.g. sub-surface investigation or feasibility reports).
For entry to Cat B	The project estimate should include up-to-date quantities, current prices and re-assessment of risk elements and contingency items.
Cat B	The project estimate should include further significant information affecting costs (e.g. contingency items are settled and/or eliminated, probability of occurrence and extent of risks elements are changed). Annually for the RAE, and once selected to start, this estimate is then the baseline against which cost and scope changes are compared and justified.
Upgrading to Cat A	An up-to-date project estimate is prepared by pricing the tender document Bills of Quantities including re-assessment of risk elements and remaining contingency items.

ANNEXURE 6: DERIVING PROBABILITY OF COST OVERRUN

SET SIZE (N)	PROBABILITY OF COST OVERRUN	EXPECTED COST OVERRUN (RS1,000,000)	IMPACT ON BUDGET
Up to 10	0.2929	Rs 292,900	**High risk**: Project managers may allocate a large contingency fund.
Up to 100	0.05187	Rs 51,870	**Moderate risk**: A more balanced contingency is allocated.
Up to 1,000	0.007485	Rs 7,485	**Low risk**: Contingency funds are reduced.
Up to 10,000	0.0009787	Rs 978.70	**Very low risk**: Minimal contingency funds are needed.
Up to 100,000	0.00011514	Rs115.14	**Minimal risk**: Little to no contingency required.
Up to 1,000,000	0.000014392	Rs 14.39	**Negligible risk**: Contingency is almost unnecessary.

Annexure 7: Recovery Rates with Separate Columns for Control & Compliance

Project Phase	Description	Control	Compliance	Recovery Rate (LCO)
Phase 1: Foundation & Substructure	Laying the foundation and constructing substructures (pillars, piers, etc.).	Moderate control over construction processes and site conditions (e.g., material procurement, site management).	Compliance with safety standards, structural codes, and local regulations.	50% (Improved control, but still site-specific risks)
Phase 2: Superstructure (Decking)	Building the deck, beams, and other structural elements.	High control due to clearer processes and established standards for construction (e.g., scheduling, contractor performance, quality control).	Compliance with building codes, safety inspections, and structural integrity standards.	65% (Increased control due to structured processes)
Phase 3: Roadway Construction & Finishing	Constructing the roadway surface, installing safety features, and final finishes.	High control due to completion of foundational and structural work, with fewer unexpected issues (e.g., lane marking, traffic management).	Compliance with traffic regulations, final inspections, and safety standards.	80% (Higher recovery due to fewer uncertainties)
Phase 4: Testing & Inspection	Final inspections, load tests, and ensuring all safety protocols are met.	Very high control (testing protocols, quality checks, load-bearing tests).	Full compliance with safety standards, final quality certifications, regulatory inspections.	90% (Minimal cost overruns, project is near completion)
Phase 5: Project Completion & Handover	Final handover to authorities, post-construction checks, and final approval.	Full control as all work is completed and the project is in its final stages (final verification).	Compliance with final approvals, certifications, and any last regulatory requirements.	95% (Very high recovery as project is effectively complete)

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The Cost Drivers of Infrastructure Projects: Definition, Classification, and Conceptualization", published by White Rose Research Online (WRRO),

The Cost Drivers of Infrastructure Projects: Definition, Classification, and Conceptualization