

資料編

資料編

1 . 調査団員氏名	1
2 . 調査行程	2
3 . 関係者（面会者）リスト	7
4 . 当該国の社会経済状況（国別基本情報抜粋）	9
5 . 討議議事録（M/D）	11
6 . 事業事前計画表	49
7 . 収集資料リスト	51
8 . その他の資料・情報	53
8 - 1 ICU 病床数の算定法	53
8 - 2 新生児病床数の算定法	56
8 - 3 受益者負担費料金表	57
8 - 4 ICU における無料病床設置の検証	58
8 - 5 ソフトコンポーネント計画書	60
8 - 6 既存棟平面図	69
8 - 7 自然条件調査結果	74
8 - 7 - 1 敷地測量図	74
8 - 7 - 2 地盤調査報告書（抜粋）	77
9 . 先方負担事業の概算根拠	109

1 . 調査団員氏名

1-1 第1回基本設計調査

担当	氏名	期間	所属
1.総括	武藤 亜子	4/18 ~ 4/29	JICA 無償資金協力部 業務第三グループ保健医療チーム
2.技術参与	松井 三明	4/18 ~ 4/29	国立国際医療センター国際医療協力局 派遣協力課
3.業務主任 / 建築計画	井出 経一	4/18 ~ 5/17	株式会社 横河建築設計事務所 海外業務部
4.建築設計	奥井 正雄	4/18 ~ 5/17	株式会社 横河建築設計事務所 海外業務部
5.設備計画	吉本 隆	4/25 ~ 5/14	株式会社 横河建築設計事務所 監理部
6.機材計画	阿部 雅典	4/18 ~ 5/17	株式会社 第一医療施設コンサルタンツ 代表取締役
7.調達 / 積算	三澤 喜選	4/25 ~ 5/14	株式会社 横河建築設計事務所 海外業務部
8.建築設計 (自主参加)	田代 正一	4/25 ~ 5/14	株式会社 横河建築設計事務所 海外業務部

1-2 第2回基本設計調査

担当	氏名	期間	所属
1.総括	松元 隆	7/5 ~ 7/10	Assistant Resident Representative JICA India Office
2.技術参与	松井 三明	7/4 ~ 7/12	国立国際医療センター国際医療協力局 派遣協力課
3.業務主任 / 建築計画	井出 経一	7/4 ~ 7/12	株式会社 横河建築設計事務所 海外業務部
4.建築設計	奥井 正雄	7/4 ~ 7/12	株式会社 横河建築設計事務所 海外業務部
5.機材計画	阿部 雅典	7/4 ~ 7/12	株式会社 第一医療施設コンサルタンツ 代表取締役

1-3 基本設計概要説明調査

担当	氏名	期間	所属
1.総括	武藤 亜子	10/12 ~ 10/21	JICA 無償資金協力部 業務第三グループ保健医療チーム
2.技術参与	松井 三明	10/13 ~ 10/22	国立国際医療センター国際医療協力局 派遣協力課
3.業務主任 / 建築計画	井出 経一	10/12 ~ 10/22	株式会社 横河建築設計事務所 海外業務部
4.建築設計	奥井 正雄	10/12 ~ 10/20	株式会社 横河建築設計事務所 海外業務部
5.機材計画	阿部 雅典	10/12 ~ 10/20	株式会社 第一医療施設コンサルタンツ 代表取締役

2 . 調査行程

2-1 第1回基本設計調査

2004年4月18日～2004年5月17日(30日間)

日順	月日(曜)	時刻	内 容
01	4月18日 (日)	14:25 20:00	官団員、コンサル団員成田発 JL-471 (井出業務主任、奥井、阿部各団員) テリ-着
02	4月19日 (月)	09:30 15:00 16:00	JICA 駐在員事務所表敬・協議 連邦政府保健省表敬 財務省、経済局表敬
03	4月20日 (火)	11:30 13:30 15:30	テリ-発 IC-877 フルネッシュワ-ル着 SVP 病院視察
04	4月21日 (水)	10:30 12:30 15:30	州政府保健部表敬・協議 州立病院視察 カリンカ病院(私立)視察
05	4月22日 (木)	09:00 11:30	SVP 病院視察 病院協議
06	4月23日 (金)	09:00 11:30 15:00	病院視察 病院協議(施設) 病院協議(機材)
07	4月24日 (土)	11:00 15:00	州政府保健部協議 病院協議
08	4月25日 (日)		資料整理ノミツツ添付資料作成
		14:25 20:00	コンサル団員成田発 JL-471(吉本、三澤、田代) テリ-着
09	4月26日 (月)	09:00 14:00 11:30 13:30 15:30	団内会議 病院協議 テリ-発 IC-877(吉本、三澤、田代) フルネッシュワ-ル着 SVP 病院既存視察、敷地概況調査
10	4月27日 (火)	10:30 14:15 16:30 17:30 08:00 15:00 16:00 10:00 16:00	州保健部 ミツツ署名(武藤総括、井出) 病院協議(松井参与) フルネッシュワ-ル発 IC-878(武藤総括、松井参与、井出) テリ-着 日本大使館報告 病院協議(奥井、阿部) 州公共事業局協議(奥井) 病院協議(阿部) 電力局担当者と協議(奥井) 病院協議(阿部) 病院協議(吉本、三澤、田代) 電力局担当者と協議
11	4月28日 (水)	09:00 15:00 16:00 09:00 10:00 12:00	現地業者(地質、測量)打合せ(井出) 財務省経済局報告(武藤総括、松井参与、井出) JICA 事務所報告 官団員 テリ-発 病院協議(機材)(阿部) 公共衛生局協議(奥井) 病院協議(施設)(吉本、三澤、田代) 病院敷地調査、既存施設調査(吉本、三澤、田代)
12	4月29日 (木)		官団員 成田着
		08:30 11:30 13:30 15:30	現地業者(地質、測量)契約(井出) テリ-発 IC-877 フルネッシュワ-ル着 病院協議

日順	月日(曜)	時刻	内 容
		09:00	病院協議(機材:阿部、施設:奥井、吉本、三澤、田代)
		10:30	病院外来棟調査/測量(奥井、吉本、三澤、田代)
13	4月30日 (金)	08:30	病院協議(井出、阿部、吉本) Elec. Regulation Commission 協議
		10:00	病院既存施設調査/測量(三澤、田代) 類似施設質疑書作成、調査計画策定(奥井)
14	5月1日 (土)	09:30	SCB メディカルカレッジ視察(コンサル団員全員)
		14:30	病院協議(井出、阿部) 質疑書作成(奥井) 敷地インフラ調査、市電話局打合せ(吉本) 病院既存施設調査/測量(三澤、田代)
15	5月2日 (日)		資料整理
16	5月3日 (月・祝日)	10:00	運営組織・システムに係る詳細確認(井出、奥井、阿部)
		16:00	資料整理
		10:00	敷地インフラ調査(吉本)
		12:00	カック市内排水処理場視察
		15:00	市電力局打合せ
		16:00	電気会社打合せ
		10:30	病院既存施設調査/測量(三澤、田代)
17	5月4日 (火)	09:30	州政府協議(井出、阿部)
		12:00	OHSDP 協議
		15:00	病院協議
		10:00	敷地インフラ調査(吉本)
		14:00	電話メーカー打合せ
		10:00	建設現場視察(三澤、田代)
		13:00	現地コンサルと建設事情の協議/確認
		15:00	調達事情調査
18	5月5日 (水)	10:00	焼却炉、マイクローブ視察(阿部、吉本) 建設事情協議/確認(三澤、田代)
		11:30	情報サービス局にて情報収集(井出、阿部、吉本) 州政府協議(井出)
		14:30	病院協議(井出、阿部)
		15:00	敷地内排水側溝調査(吉本)
		16:00	現地コンサルと協議/確認(三澤、田代)
19	5月6日 (木)		病院協議(井出、阿部)
		10:00	市開発局協議(吉本、三澤、田代)
		15:00	医療ガス供給事情調査
20	5月7日 (金)	10:00	気象庁にて調査依頼(井出、阿部) 市役所にて水害状況調査(奥井) 市開発局にて協議/確認(吉本、三澤、田代)
		11:30	州政府・医療サービス局協議(井出、阿部)
		15:00	病院協議
21	5月8日 (土・休日)	09:30	病院協議(井出、阿部) 建設事情調査(吉本、三澤、田代) 規模算定方法検討(奥井)
22	5月9日 (日)	AM	資料整理、中間報告書作成
		14:00	病院協議(井出、奥井、阿部)
		14:15	ブルネシヨール発 IC-878 (吉本、三澤、田代)
		16:00	テリ-着
23	5月10日 (月)	09:00	病院協議(井出、奥井、阿部) 運営システム質疑、施設優先順位協議、敷地測量チェック
			テリ-、選挙により終日外出禁止 資料整理(吉本、三澤、田代)

日順	月日(曜)	時刻	内 容
24	5月11日 (火)	10:00	現地コンサル調査、資料整理
		14:00	病院と協議 ICU 設置目的、レター受取り
		10:00	建設現場視察、建設事情調査
25	5月12日 (水)	09:30	病院協議(井出、阿部) ホーリング調査チェック、最終要請機材リスト受取り
		14:15	アパネシワール発 IC-878
		16:30	テリ-着
		10:00	建設事情調査
26	5月13日 (木)	09:30	JICA 事務所訪問
		10:00	カラティサラン小児病院視察
		PM	現地調査概要作成(井出)、施設計画検討(奥井)、機材計画検討(阿部)
		21:05	テリ-発 JL-472(吉本、三澤、田代)
27	5月14日 (金)	08:30	成田着(吉本、三澤、田代)
		11:00	現地業者打合せ
		15:00	JICA 事務所訪問
		16:30	日本大使館報告
28	5月15日 (土)	AM	テリ-市内建設現場視察(井出、奥井) 機材調達事情調査(阿部)
		PM	資料整理
29	5月16日 (日)	10:00	測量会社より図面受領(井出) 資料整理
		21:05	テリ-発 JL-472
30	5月17日 (月)	08:30	成田着

2-2 第2回基本設計調査

2004年7月4日～2004年7月12日(9日間)

日順	月日(曜)	時刻	内 容
01	7月4日 (日)	14:25 19:40	松井参与、コンサル団員成田発 JL-471 (井出業務主任、奥井、阿部各団員) テリ-着
02	7月5日 (月)	11:30 13:30 15:30 18:30	空港で松元団長と合流、テリ-発 IC-877 プハ'ネシュワ-ル着 州政府保健部表敬、インテリムレホ'-説明 団内会議
03	7月6日 (火)	11:00 13:30 14:15 18:30	州政府保健大臣表敬・協議 病院協議 松元団長 プハ'ネシュワ-ル テリ- 団内会議
04	7月7日 (水)	09:00 20:00	病院協議(施設) 団内会議
05	7月8日 (木)	09:00 13:30 18:30	病院協議(機材) 松元団長テリ- プハ'ネシュワ-ル 病院協議に合流 ホテルにて団内会議
06	7月9日 (金)	11:00 15:00 17:00 19:00	ミッツ案協議 州政府にてミッツ署名 病院協議(技術協力) 団内会議
07	7月10日 (土)	08:30 09:00 11:30 14:15 20:00	病院視察(松井参与、阿部) 現地コンサルタントと協議(井出、奥井) 病院協議(施設・機材案) 松元団長 プハ'ネシュワ-ル テリ- IC-878 ホテルにて副院長と協議(松井、井出)
08	7月11日 (日)	09:00 11:00 14:15 16:15 21:05	機材追加質問の検討(松井参与、井出、阿部) ホテルにて副院長と協議 プハ'ネシュワ-ル発 IC-878 テリ-着 テリ-発 JAL472 (松井参与、井出業務主任、奥井、阿部)
09	7月12日 (月)	08:30	成田着

2-3 基本設計概要説明調査

2004年10月12日～2004年10月22日(11日間)

日順	月日(曜)	時刻	内 容
01	10月12日 (火)	14:25 19:40	武藤総括、コンサル団員成田発 JL-471 (井出業務主任、奥井、阿部各団員) テリ-着
02	10月13日 (水)	09:30 11:00 15:30 10:55	JICA 事務所表敬・協議 日本大使館表敬・協議 財務省表敬・協議 松井参与成田発 JL-717
03	10月14日 (木)	09:40 11:30 13:30 15:30 16:30 17:30 18:30	松井参与ﾌﾞﾙ内ｼﾞｭｰﾙ着 S-2316 武藤総括、コンサル団員テリ-発 ﾌﾞﾙ内ｼﾞｭｰﾙ着 UNICEF 事務局訪問(官団員、井出業務主任) セナルティ次官と協議 州政府チ-ﾌﾞセクレﾀﾘ-表敬・協議(官団員、井出業務主任) ホテルにて団内会議
04	10月15日 (金)	09:00 10:30 18:30	病院協議 病院キャンパス内視察 基本設計概要書の説明 ホテルにて団内会議
05	10月16日 (土)	09:00 18:30	病院協議 基本設計概要書打合せ ホテルにて団内会議
06	10月17日 (日)		ミッツ案作成、資料整理
07	10月18日 (月)	09:00 18:30	病院協議 基本設計概要書および機材入ﾊﾟｯｸ案協議 ホテルにて団内会議
08	10月19日 (火)	11:00 11:30 12:00 16:30 10:30 14:15 21:05	修正ミッツ案協議(武藤総括、井出業務主任) 州政府保健省大臣表敬(武藤総括、井出業務主任) 州政府チ-ﾌﾞﾐﾆｽﾀ-表敬(武藤総括、井出業務主任) 州政府にてミッツ署名(武藤総括、松井参与、井出業務主任) 現地コンサルタント協議(奥井) ﾌﾞﾙ内ｼﾞｭｰﾙ テリ-(奥井、阿部) テリ-発 JL-472(奥井、阿部)
09	10月20日 (月)	14:15 16:15 08:30	資料整理 ﾌﾞﾙ内ｼﾞｭｰﾙ発 テリ-着 奥井、阿部成田着
10	10月21日 (木)	00:05 16:00 10:30 14:30 15:30 17:00 21:05	武藤総括テリ-発 TG316 (ﾊﾞﾝｺｯｸ経由) 成田着 TG676 カラティサン病院視察(松井参与、井出業務主任) JICA イﾝﾄﾞ事務所報告 保健省報告、ミッツ署名 財務省報告 テリ-発 JAL472
11	10月22日 (金)	08:30	成田着

3 . 関係者（面会者）リスト

所属	氏名	部署 / 職位
インド国中央政府関係者		
財務省	Ms. Chaudhuri Mr. Dheeraj Bhatnagar Mr. Prashant, IAS	Under Secretary, Department of Economic Affairs, Ministry of Finance 財務省経済事務局副長官 Director, Department of Economic Affairs, Ministry of Finance 財務省経済事務局課長 Director, Department of Economic Affairs, Ministry of Finance 財務省経済事務局課長
保健家族福祉省	Dr. Rajesh Bhushan	Director (International Health), Department of Health, Ministry of Health and Family Welfare 保健家族福祉省(国際保健)課長
オリッサ州政府関係者		
	Mr. Naveen Pattnaik Mr. Subash Pani Mr. Shri Bijayashree Routray Mr. Manoranjan Saran	Chief Minister 州政府チーフ・ミニスター Chief Secretary チーフ・セクレタリー Honorable Minister of Health and Family Welfare 保健・家族福祉省大臣 Pvt. Secretary to Chief Minister チーフ・ミニスター首相秘書
保健家族福祉部	Mr. R. N. Senapati Mr. Gangadhar Singh Mr. Rajanikanta Dey Mr. B. C. Jena Dr. B. C. Das Dr. S. C. Mohapatra Dr. B. K. Das Dr. P. K. Senapati Mr. Harekrishna Bhol	Commissioner & Secretary コミッショナー・セクレタリー Joint Secretary ジョイント・セクレタリー(次官) Joint Secretary ジョイント・セクレタリー(次官) Additional Secretary アディショナル・セクレタリー Director, Medical Education & Training 医学教育研修局長 Director of Medical Education & Training Director of Family Welfare 家族福祉局長 Director of Health Services 保健サービス局長 F.A.-cum-Joint Secretary, Health and Family Welfare
保健・家族福祉部 プロジェクト関係者		
	Dr. Suresh Chandra Mishra Eng. B. C. Tripathy	Project Medical Officer, OHSDP Executive Engineer, OHSDP
Policy & Strategic Planning Unit		
	Dr. Jyotsna Patnaik, M. S. Mr. K. Ananda Reddy	Officer on Special Duty Reform Facilitator
Sector Reform Cell (Sector Investment Programme)		
	Dr. H. N. Patnaik Dr. Shiba Kumar Rath	Project Director Consultant
SVP 小児医療教育病院		
	Dr. Aswini Kumar Mohanty Dr. Bijoy Kumar Behera Dr. H. K. Mohanty Dr. Niranjana Parida Dr. S. L. Das Dr. D. Samal Dr. Pravakar Mishra Dr. Arakhita Swain Dr. Ajit Kumar Das Dr. P. K. Jean	Professor, Head of Department of Paediatrics & Superintendent 病院長 / 小児科長 / 教授 Deputy Superintendent 副病院長 Professor and H.O.D. of Paediatric Surgery 小児外科長 / 小児外科教授 Professor of Paediatric Surgery 小児外科教授 Assistant Professor of Paediatrics 小児科助教授 Assistant Professor of Paediatrics 小児科助教授 Assistant Professor of Paediatrics 小児科助教授 Assistant Professor of Paediatrics 小児科助教授 Assistant Professor of Paediatrics 小児科助教授 Lecturer in Paediatrics 小児科講師

所属	氏名	部署 / 職位
	Dr. J. R. Champatiray	Lecturer in Paediatrics 小児科講師
	Dr. A. K. Goel	Lecturer in Paediatrics 小児科講師
	D. S. K. Jena	Lecturer in Paediatrics 小児科講師
	Dr. M. C. Murmu	Lecturer in Paediatrics 小児科講師
	Dr. K. N. Majhi	Lecturer in Paediatrics 小児科講師
	Dr. Sucharita Mohanty	Lecturer in Biochemistry 生化学講師
	Dr. Kalyani Parida	Radiodiagnosis 放射線診断技師
	Dr. D. P. Mohanty	Lecturer in Anesthesiology 麻酔科講師
	Dr. P. K. Mohanty	Lecturer in Paediatric Surgery 小児外科講師
	Dr. Shreela Mishra	Lecturer in Pathology 病理学講師
	Dr. Sonali Mandal	Specialist, Paediatric Medicine 小児内科専門医
	Dr. D. R. Satpathy	Specialist, Paediatric Medicine 小児内科専門医
	Dr. S. Panda	Assistant Surgeon, Paediatric Medicine 小児外科医
	Dr. Debishankar Acharya	Assistant Surgeon, Paediatric Medicine 小児外科医
	Mr. Madhusudan Naik	Asst. Clinical Psychologist, Psychiatry
	Mr. Lagnajit Ray	Administrative Officer 事務局長
カリंगा小児病院: Kalinga Hospital Ltd.		
	Dr. Sarat Ch Panda	MS (General Surgery, Deputy Medical Superintendent)
SCB メディカルカレッジ: SCB Medical College		
	Dr. Dharendra Ku. Roy	Professor & HOD of Surgery Principal & Dean
	Dr. N.K. Mohanty	Superintendent
ブバネシュワール州立病院: Capital Hospital Bhubaneswar		
	Dr. Niranjan Pradhan M.D.	Chief Medical Officer
オリッサ州公共事業局: Department of Works, Government of Orissa		
	Mr. C.V.K. Shastri	Electrical Engineer 電気技術者
	Mr. Jagannath Dhal	Electrical Engineer 電気技術者
	Mr. S. K. Halder	Assistant Civil Engineer 施設技術者
	Mr. S. K. Samal	Assistant Civil Engineer 施設技術者
	Mr. P. K. Pradhan	Junior Civil Engineer 施設技術者
	Mr. B. R. Rath	Junior Civil Engineer 施設技術者
オリッサ州電気管理委員会: Orissa Electricity Regulatory Commission (OERC)		
	Mr. Shital Kumar Jena	Commissioner
カタック市役所: Cuttack Municipal Corporation		
	Ms. Nibedita Pradhan	Mayor 市長
カタック市開発庁: Cuttack Development Authority		
	Mr. Purna Chandna Ndok	Secretary 長官
	Mr. S. M. Pattnaik	Planning Member
オリッサ州消防局: Fire Department, Govt. of Orissa		
オリッサ州	Mr. S.P.B. Mohanty	State Fire Prevention Officer
カタック市	Mr. Manoranjan Bhol	Fire Station Officer
カラワティサラン小児病院: Kalawati Saran Children's Hospital		
	Dr. Shashi Saini	Additional Medical Superintendent
	Dr. A. K. Dutta	Director-Professor & Head, Paediatrics
UNICEF オリッサ事務所		
	Dr. A. R. Chandrasekaran	Project Officer, Health プロジェクト・オフィサー
	Dr. Ashish Kumar Sen	APO-Safe Motherhood & Women's Health
	Dr. Niranjan Kar	Ex Director of Health Service
日本大使館	中野智行	在インド日本国大使館一等書記官
JICA	酒井利文	JICA インド事務所長
	伊藤耕三	次長
	松本 隆、Mr. R. Dinakar	所員

4. 当該国の社会経済状況（国別基本情報抜粋）

主要指標一覧

	指標項目	1989年	1999年	2000年	2001年	2001年の 地域平均値
社会 指 標 等	国土面積（1000k m ² ）	2,973	2,973	2,973	2,973	n.a.
	人口（百万人）	832.5	999.0	1,015.9	1,032.4	1,377.8
	人口増加率（%）	2.0	1.7	1.6	1.5	1.7
	出生時平均余命（歳）	n.a.	n.a.	63	63	63
	妊産婦死亡率（/10万人）	n.a.	n.a.	n.a.	410(90-98)	n.a.
	乳児死亡率（/1000人）	91.0	70.0	68.0	67.0	70.6
	一人当たりカロリー摂取量（kcal/1日）*1	2,421	2,499	2,489	2,487	2,701
	初等教育総就学率（男）（%）	n.a.	110.8	n.a.	n.a.	n.a.
	（女）（%）	n.a.	91.7	n.a.	n.a.	n.a.
	中等教育総就学率（男）（%）	n.a.	56.7	n.a.	n.a.	n.a.
	（女）（%）	n.a.	40.1	n.a.	n.a.	n.a.
	高等教育総就学率（%）	n.a.	10.5	n.a.	n.a.	n.a.
	成人非識字率（15歳以上の人口の内：%）	51.5	43.6	42.8	42.0	44.7
	絶対的貧困水準（1日1\$以下の人口比：%）	n.a.	n.a.	n.a.	34.7(99-00)	n.a.
失業率（%）	n.a.	n.a.	n.a.	n.a.	n.a.	
経 済 指 標	GDP（百万USドル）	292,013	445,299	457,049	477,342	613,755
	一人当たりGNI（USドル）	390	440	450	460	450
	実質GDP成長率（%）	6.4	6.1	4.0	5.4	4.9
	産業構造（対GDP比：%）					
	農業	31.3	26.2	24.9	25.1	24.9
	工業	27.6	26.0	26.9	26.5	25.9
	サービス業	41.2	47.8	48.2	48.4	49.2
	産業別成長率（対GDP比：%）					
	農業	1.5	1.3	-0.2	5.7	4.2
	工業	10.3	40.9	6.3	3.1	3.4
	サービス業	8.8	9.5	4.8	6.6	6.0
	消費者物価上昇率（インフレ：%）	6.2	4.7	4.0	3.7	n.a.
	財政収支（対GDP比：%）	-7.4	-5.5	-5.2	-4.7	-4.9
	輸出成長率（金額：%）	13.7	16.7	20.9	9.0	9.1
	輸入成長率（金額：%）	-0.6	12.7	10.6	4.9	4.6
	経常収支（対GDP比：%）	-2.5	-1.1	-0.6	0.3	n.a.
	外国直接投資純流入額（百万ドル）	252	2,169	2,315	3,403	4,066
	総資本形成率（対GDP比：%）	23.7	23.6	22.9	22.5	21.6
	貯蓄率（対GDP比：%）	21.4	20.5	20.3	20.7	19.4
	対外債務残高（対GNI比：%）	2.4	2.3	2.4	2.0	2.3
DSR（対外債務返済比率：%）	29.4	15.3	14.0	11.7	12.7	
外貨準備高（対輸入月比：%）	3.1	6.0	6.0	7.4	6.9	
名目対ドル為替レート*2 （通貨単位：ルピー-Rupee）	16.226	43.055	44.942	47.186	n.a.	
政治 指 標	*3 政治体制：連邦共和制。首相が実質的な権力者 憲法：1949年11月26日制定、50年1月26日発効 元首：大統領。アブドゥル・カラム（Abdul KALAM）。間接選挙制。任期5年。2002年7月25日就任 議会：2院制。上院（245議席）と下院（545議席）					

出典 World Development Indicators CD-ROM 2003 World Bank

*1 FAO Food Balance Sheets 2003年6月 FAO Homepage

*2 International Financial Statistics Yearbook 2002 IMF

*3 世界年鑑 2004 共同通信社

注（）に示されている数値は調査年を示す。（90-98）と示されている場合は1990年度から98年度までの間の最新値を示す

「人口」、{GDP}及び「外国直接投資純流入額」の「2001年の地域平均値」においては、地域の総数を示す地域は南アジア。ただし「一人当たりカロリー摂取量」における地域はアジア広域
就学率が100%を超えているのは、学齢人口推計値と実際の就学データの間になずれがあるため

政府歳入・歳出 [インド]

	1999年	2000年 p	2001年 f		2001年
	(十億ルピー)	(十億ルピー)	(十億ルピー)	(百万US\$)*	対GDP比**
歳入 + 贈与受取額	2,360.7	2,704.2	3,100.7	65,712.3	13.8%
歳入	2,349.7	2,696.9	3,093.7	65,563.9	13.8%
經常歳入	2,326.9	2,667.0	2,968.3	62,906.4	13.2%
租税収入	1,717.5	1,983.2	2,266.5	48,033.3	10.1%
非税収入	609.4	683.8	701.8	14,873.1	3.1%
資本歳入	22.8	29.9	125.4	2,657.6	0.6%
贈与受取額	11.1	7.3	7.0	148.3	0.0%
歳出 + 純貸付額	3,422.2	3,791.3	4,179.9	88,583.5	18.6%
歳出	3,013.1	3,486.8	3,953.1	83,777.0	17.6%
經常歳出	2,738.6	3,211.4	3,600.1	76,295.94	16.0%
資本歳出	409.1	304.5	226.8	4,806.51	1.0%
財政収支	-1,061.5	-1,087.1	-1,079.2	-22,871.2	-4.8%

歳出内訳 [インド]

	1999年	2000年 p	2001年 f		2001年	
	(十億ルピー)	(十億ルピー)	(十億ルピー)	(百万US\$)*	内訳	対GDP比**
歳出	3,013.1	3,486.8	3,953.1	83,777.0	100.0%	17.6%
一般サービス	195.9	227.6	242.3	5,135.0	6.1%	1.1%
国防	467.9	541.7	616.8	13,071.7	15.6%	2.7%
公安	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
教育	77.1	87.1	87.9	1,862.8	2.2%	0.4%
保健・医療	53.5	57.7	71.0	1,504.7	1.8%	0.3%
社会保障・福祉	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
住宅・生活関連施設	156.2	167.4	175.9	3,727.8	4.4%	0.8%
レクリエーション・文化	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
エネルギー	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
農林水産業	174.0	190.8	199.0	4,217.4	5.0%	0.9%
鉱工業・建設業	67.2	66.0	68.3	1,447.5	1.7%	0.3%
運輸・通信	60.0	48.4	50.9	1,078.7	1.3%	0.2%
その他	1,761.3	2,100.1	2,441.0	51,731.4	61.7%	10.9%

f: The letter f denotes forecasted or projected data.

会計年度は4月～3月

p: The letter p denotes data that are preliminary or provisional.

*: 対ドル換算レートは Market Rate, Period Average 出典は International Financial Statistics Yearbook 2002 IMF

** : GDP の出典は The World Economic Outlook 2003 IMF Homepage

出典 Government Finance Statistics Yearbook 2002 IMF

JICA の対インド技術協力

通貨単位	1998年度	1999年度	2000年度	2001年度	2002年度	累計
億円	10.19	9.83	9.03	10.15	9.60	209.32
百万ドル	7.79	8.63	8.38	8.35	7.66	

注：年の区切りは日本の会計年度（4月～3月）。また対ドル換算レートは OECD Homepage による。

出典 JICA 実績表 2003年3月 国際協力機構

我が国の対インド ODA 実績

(支出純額、単位：百万ドル)

暦年	贈与					政府貸付			合計
	無償資金協力		技術協力		計	支出総額	支出純額		
97	31.84	(6)	23.26	(5)	55.10 (11)	641.26	436.70 (89)	491.80 (100)	
98	23.10	(5)	20.51	(4)	43.62 (9)	681.88	461.33 (91)	504.95 (100)	
99	14.57	(2)	22.48	(4)	37.05 (6)	864.95	569.97 (94)	634.02 (100)	
2000	3.47	(1)	21.38	(6)	24.85 (7)	630.64	343.31 (93)	368.16 (100)	
2001	5.32	(1)	18.03	(3)	23.34 (4)	814.84	505.52 (96)	528.87 (100)	
累計	512.70	(6)	306.99	(4)	819.65 (10)	10,634.10	7,105.08 (90)	7,924.74 (100)	

注：年の区切りは1月～12月の暦年。

() 内は ODA 合計に占める各形態の割合(%)

出典 ODA 国別データブック 2002年 外務省

DAC 諸国・国際機関の対インド ODA 実績

(支出純額、単位：百万ドル)

暦年	1位		2位		3位		4位		5位		うち日本	合計
98	日本	505.0	英国	186.6	ドイツ	106.5	デンマーク	37.7	オランダ	27.0	505.0	915.1
99	日本	634.0	英国	131.7	ドイツ	29.6	デンマーク	25.1	スウェーデン	19.4	634.0	838.3
2000	日本	368.2	英国	204.2	ドイツ	15.6	スウェーデン	15.4	英国	14.6	368.2	650.3

暦年	1位	2位		3位		4位		5位		その他	合計
98	IDA	578.5	CEC	50.1	UNICEF	29.9	WFP	12.3	Montreal Protocol	10.7	713.2
99	IDA	486.1	CEC	77.9	UNICEF	30.5	WFP	21.4	UNDP	16.0	664.6
2000	IDA	655.2	CEC	59.7	UNICEF	31.9	WFP	27.0	UNDP	21.2	864.5

注：年の区切りは1月～12月の暦年。

出典 ODA 国別データブック 2002年 外務省

5. 討議議事録(M/D)

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF SARDAR VALLVBHAI PATEL POST
GRADUATE INSTITUTE OF PAEDIATRICS IN THE STATE OF ORISSA

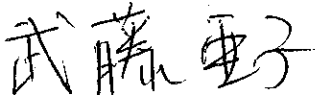
In response to a request from the Government of India (hereinafter referred to as "India"), and based on the results of preliminary study conducted in July 2003, the Government of Japan decided to conduct a Basic Design Study on a Project for Improvement of Sardar Vallvbhai Patel (hereinafter referred to as "S.V.P.") Post Graduate Institute of Paediatrics in the State of Orissa (hereinafter referred to as "the Project") and entrusted the Basic Design Study to the Japan International Cooperation Agency (hereinafter referred to as "JICA"). JICA sent to India the Basic Design Study Team (hereinafter referred to as "the Team"), headed by Ms. Ako MUTO, Health Team, Project Management Group III, Grant Aid Management Department, JICA. The team stayed in the country from April 18 to May 16, 2004.

The Team held discussions with the officials concerned of the Government of India and conducted a field survey in the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Bhubaneswar, 27 April, 2004

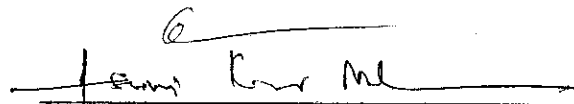
New Delhi, 28 April, 2004



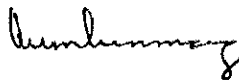
Ms. Ako Muto
Leader
Basic Design Study Team
Japan International Cooperation Agency



Mr. R.N. Senapati, I.A.S.
Commissioner-Cum-Secretary
Department of Health and Family Welfare
Government of Orissa



Dr. Aswini Kumar Mohanty
Superintendent
S.V.P. Post Graduate Institute of Paediatrics
Government of Orissa



Mr. V. Vum Lun Mang, I.A.S.
Deputy Secretary
Department of Economic Affairs
Ministry of Finance
Government of India



Mr. Rajesh Bhushan, I.A.S.
Director, Department of Health
Ministry of Health and Family Welfare
Government of India

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve paediatrics medical services provided by S.V.P. Post Graduate Institute of Paediatrics.

2. Project site

The site of the Project is in the premises of S.V.P. Post Graduate Institute of Paediatrics, Cuttack, Orissa State, India.

3. Responsible and Implementing Agency

The Responsible Agency is Department of Health and Family Welfare, Government of Orissa and the Implementing Agency is S.V.P. Post Graduate Institute of Paediatrics. The Organizational Chart is attached as Annex-1.

4. Items requested by the Indian Side

After discussions with the Team, the components of the facilities described in Annex-2 in the Project site plan described in Annex-3 and the equipment described in Annex-4 were finally requested by the Indian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval. However, the final components of the Project will be decided after further review in Japan.

5. Japan's Grant Aid Scheme

5-1. The Indian side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-5 and Annex-6.

5-2. The Indian side will take the necessary measures, as described in Annex-7, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

6-1. The consultants will proceed to further studies in India until May 16, 2004.

6-2. JICA will prepare the draft report in English and dispatch the Team in order to explain its contents around September 2004.

6-3. In case that the contents of the report are accepted in principle by the Indian side, JICA will complete the Basic Design Study Report and send it to India around November, 2004.

7. Other relevant issues

7-1. The Indian side confirmed that this project is state project and all relevant matters related to the Project such as Banking Arrangement/Authorization to Pay, exemption of local taxes, etc.

will be done by Government of Orissa. If there are any measures to be taken by Central government such as Customs Clearance, Tax Exemption including *Ad valorem* duty on importing material for constructing the facilities and on importing the equipment, etc., the Government of Orissa will request Central Government for such measures at suitable time.

7-2. The Indian side explained that Expenditure/Finance Committee's clearance was not applicable to this Project, whereas clearances required at the State level would be obtained promptly.

7-3. Both sides confirmed that counterpart fund shall not affect the necessary budgetary allocation for this Project and the Government of Orissa will take necessary procedure for counterpart fund promptly.

7-4. It is the responsibility of the Government of Orissa to provide sufficient number of medical and paramedical staff, and security, cleaning and maintenance services etc., to operate and maintain the facilities and equipment provided by this Project. The Team recommended S.V.P. Post Graduate Institute of Paediatrics to allocate appropriate number of well trained health personnel to I.C.U.s.

7-5. It is the responsibility of the Government of Orissa to allocate to S.P.V. Post Graduate Institute of Paediatrics necessary budget for operation and maintenance cost such as water and electricity charges for facilities, repairs, spareparts, reagents, consumables and periodical or annual maintenance contracts after delivery for the equipment provided by the Project.

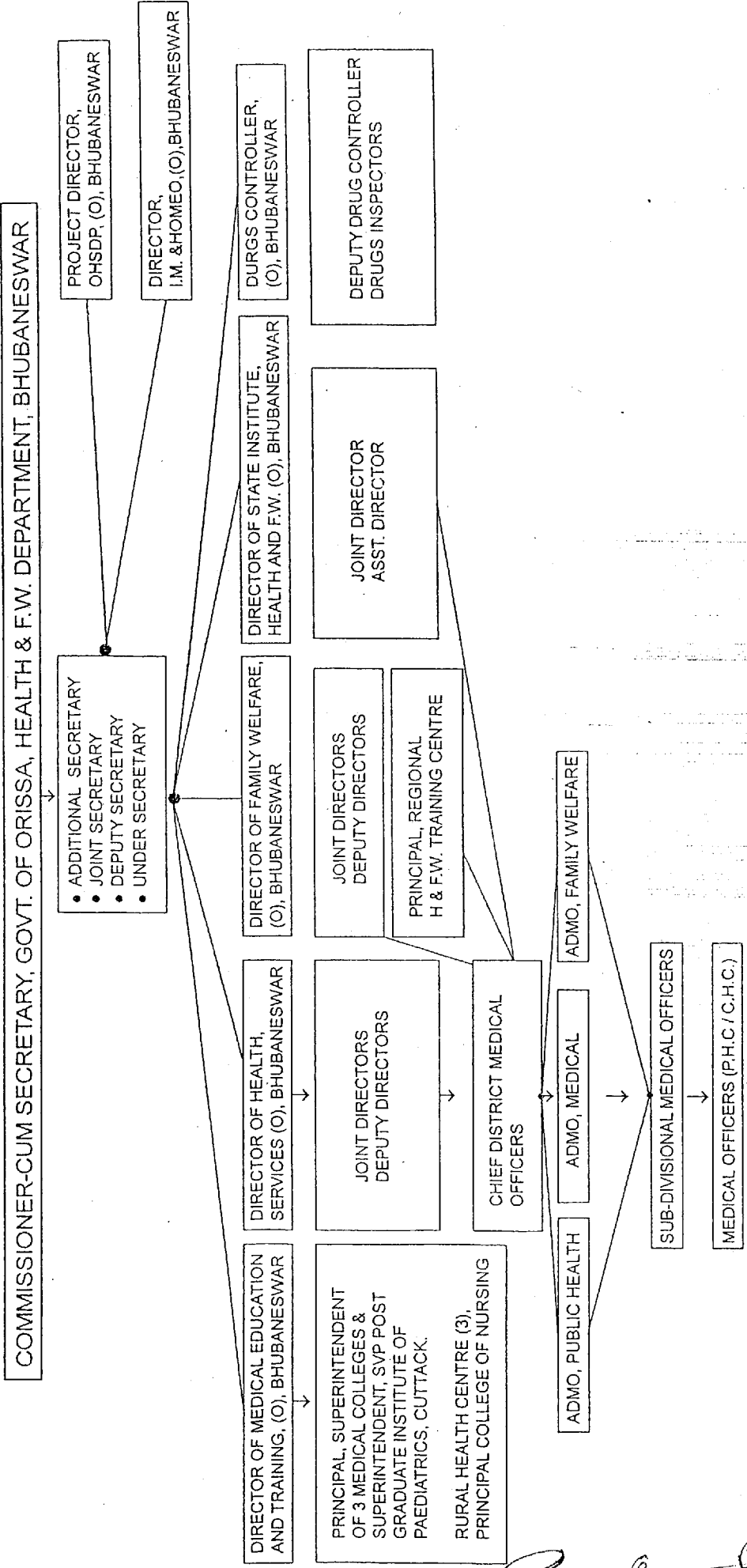
7-6. The team explained and the Government of Orissa accepted that warranty period of the equipment provided by this Project is one year and warranty is applicable only for the problem caused by defect.

7-7. S.V.P. Post Graduate Institute of Paediatrics promised that certain measures, such as exemption of user charges, should be taken in deserving cases.

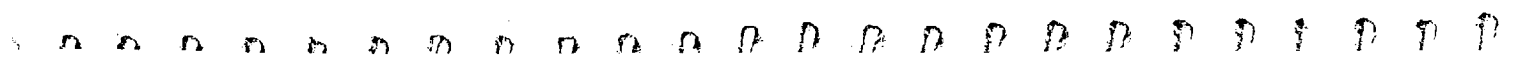
List of Annexes

- Annex-1 Organization Chart
- Annex-2 Modified Project Component of Facilities
- Annex-3 Project Site Plan
- Annex-4 List of Requested Equipment
- Annex-5 Japan's Grant Aid Scheme
- Annex-6 Flow Chart of Japan's Grant Aid Procedures
- Annex-7 Major Undertakings to be taken by Each Government

ORGANIZATION CHART



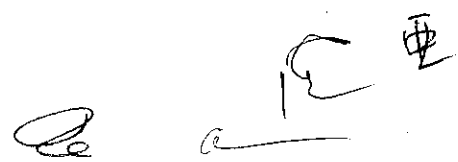
[Handwritten signatures and initials]

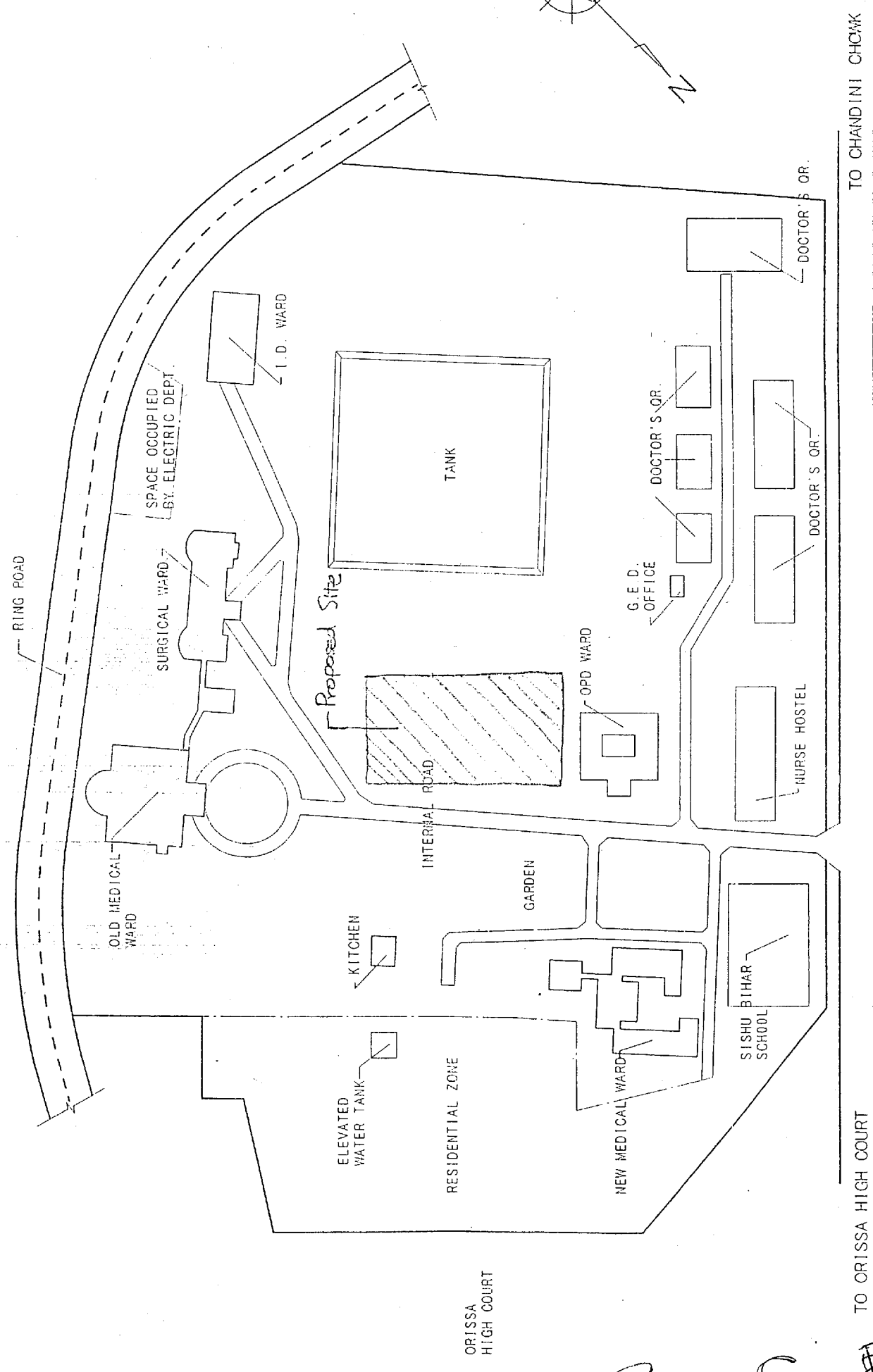
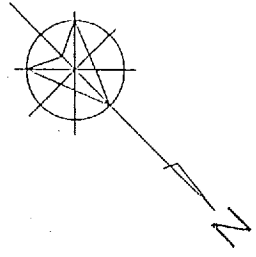


Modified Project Component of Facilities

Annex-2

- Workshop..... Neutral
- Central Store..... Neutral
- OPD..... Basically Positive
- Casualty..... Basically Positive
- C.S.S.D..... Positive
- O.T. Complex..... Positive
- Paediatric Surgery Ward (20 Beds) with Doctors' Room Concept is positive, number is neutral.
- ICU. PICU-20 Ditto
 NICU-10..... Ditto
 SICU-04 Ditto
- Neonatal Ward (40 Beds) Ditto
- Medical Ward to move 65 beds from Old (as 350 years) Medical Ward Low Priority
- Central Laboratory Basically Positive
- Radio Diagnosis / Image Section Basically Positive
- Doctors Consulting / Teaching Room (10) Low Priority
- Play Room Low Priority
- Family Attendants Rest Shed Neutral
- Oxygen Plant Low Priority
- Central Supply Facilities for Oxygen, Medical Air & Suction..... Neutral





SITE PLAN OF SVP POST GRADUATE INSTITUTE OF PAEDIATRICS, ORISSA (1/1,500)
(CURRENT)

101
Handwritten signatures and initials at the bottom of the page.

List of Requested Equipment

S. No.	Name of Equipment
1	Automatic Film Processor
2	General X-Ray Machine
3	Manual Film Processing Tank
4	Portable X-Ray Machine
5	LCD Projector
6	Anesthesia Apparatus
7	Automatic Hand Dryer
8	Cold Light Source (Ceiling Type)
9	Cold Light Source (Stand Type)
10	Electric Surgery Apparatus
11	Major Operation Instrument Set "NID-A"
12	Mayo Instrument Table
13	Minor Operation Instrument Set "NID-B"
14	Operation Table
15	Resuscitation Unit
16	Suction Unit
17	Fogging Machine for Sterilization
18	Apnea Monitor
19	Baby Bassinate
20	Blood Gas Analyzer
21	Ultrasound Guided Biopsy Kit for Existing Ultrasound Machine
22	ECHOCardiographic Probe for 2D-ECHO for Existing Ultrasound Machine
23	Infant Incubator, Portable Type
24	Infant Ventilator, Portable Type
25	Infusion Pump
26	Neonate Monitor (Multi-parameter)
27	Low Pressure Continuous Suction Unit
28	Oxygen Analyzer
29	Oxygen Head Box
30	Perpex Heat Shield

31	Phototherapy Unit (Double Surface)
32	Pulse Oximeter
33	Radiant Heat Warmer
34	Syringe Pump
35	Chemistry Auto Analyzer
36	Bilirubinometer
37	Micro Centrifuge
38	Refrigerator
39	ICU Bed "NID-C"
40	Patient Bed
41	Mobile Resuscitation Unit
42	Suction Unit
43	Ambulance, Airconditioner, Diesel
44	Boiling Sterilizer
45	High-pressure Steam Sterilizer
46	Table Top Steam Sterilizer
47	Working Table
48	ECG
49	Fiberoptic Endoscope for Peadiatric(Broncho)
50	Fiberoptic Endoscope for Peadiatric(Gastroscope)
51	Fiberoptic Endoscope for Peadiatric(Colonoscope)
52	Electronic Height Scale for Paed. & Infant
53	Infant Treatment Table
54	Instrument Cabinet
55	IV-Stand
56	Laryngoscope Set
57	Oxygen Cylinder with Flow Meter
58	Ultrasonic Nebuliser
59	Ultrasound Diagnostic Machine with Additional Neonatal Probe
60	Electronic Weighing Scale for Paed & Infant
61	X-ray Film Viewer
62	Bedside Multi-parameter Monitor for PICU
63	Bedside Multi-parameter Monitor for NICU
64	Bedside Multi-parameter Monitor for SICU
65	Ventilator (Paediatric)

Be *12* *11*
a

66	Ventilator (Neonatal)
67	Ventilator for SICU
68	Defibrillator
69	Ambubag with Face Mask & Oxygen Reserver
70	Emergency Cart
71	Wheel Chair
72	Stretcher
73	Blood Cell Counter
74	Urine Analyzer
75	Coagulometer
76	Automatic Immunological Analyzer
77	Fluorescence Microscope
78	Microwave Apparatus for Biomedical Waste Management
79	Waste Shredder
80	CT Scanner (Spiral)
81	Protection Materials against X-ray Irradiation
82	Oxygen Cylinder (Big)

Qe *15 12*
a

Japan's Grant Aid

The Grant Aid Scheme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulation of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures.

Application (request made by a recipient country)

Study (Basic Design Study conducted by JICA)

Appraisal & Approval (appraisal by the Government of Japan and approval by the Cabinet of Japan)

Determination of Implementation (Exchange of Notes between both Governments)

Implementation (implementation of the Project)

(2) Firstly, an application or a request for a Grant Aid project submitted by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Japan's Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request. If necessary, JICA sends a Preliminary Study Team to the recipient country to confirm the contents of the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study Report prepared by JICA and the results are then submitted to the cabinet for approval.

Fourthly, the project approved by the cabinet becomes official with the Exchange of Notes signed by the Government of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

2. Basic Design Study

(1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

- a) Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation,
- b) Evaluation of the appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,
- c) Confirmation of items agreed on by the both parties concerning a basic concept of the Project,
- d) Preparation of a basic design of the Project,
- e) Estimation of cost of the Project,

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even through they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by the interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

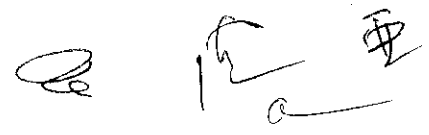
The consulting firm(s) used for the study is (are) recommended by JICA to a recipient country to also work in the Project's implementation after Exchange of Notes, in order to maintain technical consistency between the Basic Design and detailed Design.

3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

Japan's Grant Aid is extend in accordance with the Notes exchanged by the two Government concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid etc., are confirmed.

(2) "The period of the Grant Aid" means one Japanese fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and final payment to them must be completed.



However, in case of delays in delivery, installation of construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(3) Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country.

However the prime contractors, namely, consulting, contractor and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(5) Undertakings Required to the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- a) To secure land necessary for the sites of the project, and to clear, level and reclaim the land prior to commencement for the construction,
- b) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) To secure buildings prior to the installation work in case the installation of the equipment,
- d) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
- e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
- f) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) Proper Use

The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for the operation and maintenance as well as to bear all expenses other than those covered by the Grant Aid.

(7) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

(8) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the Verified Contracts.

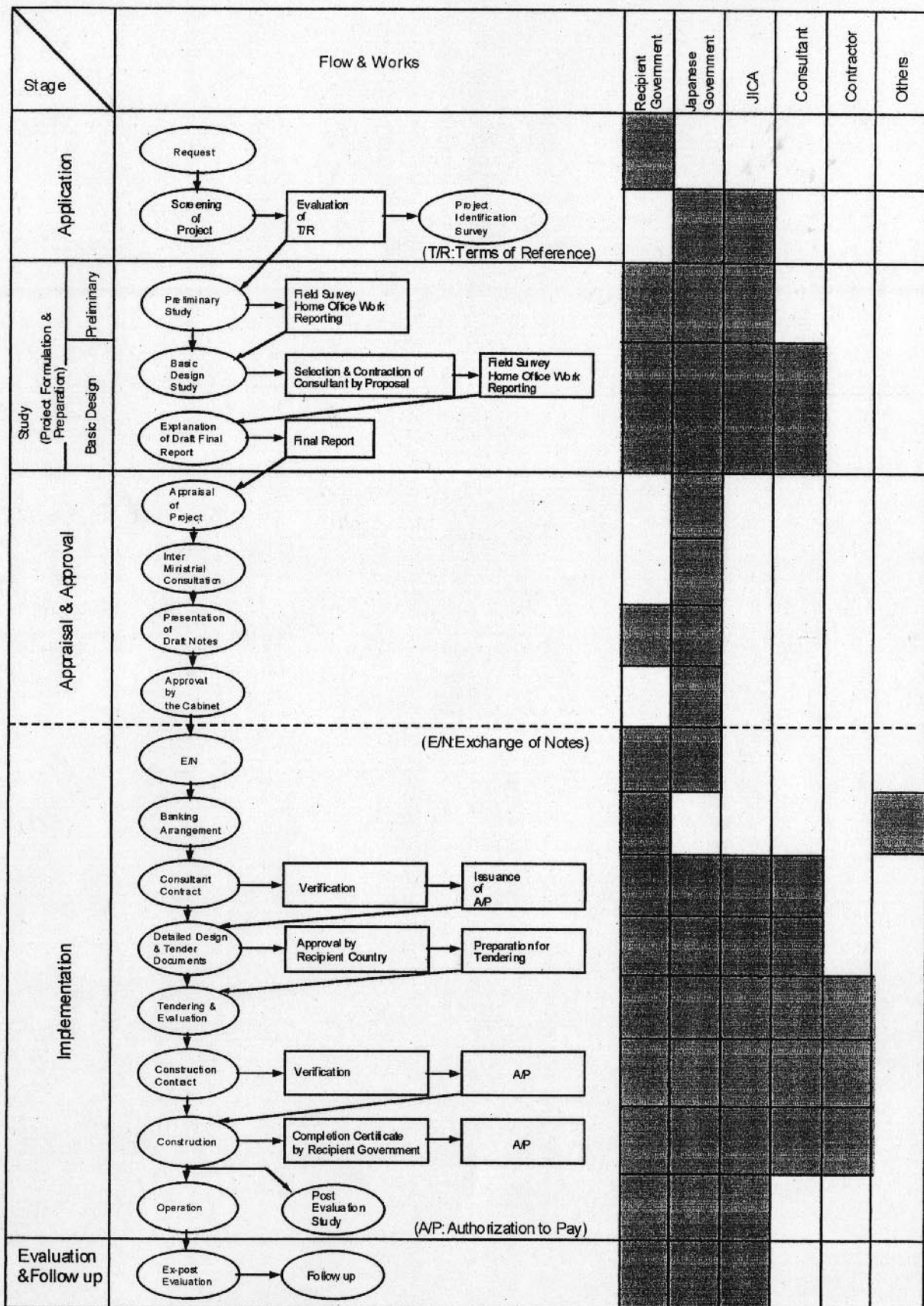
b) The payments will be made when payment requests are presented by the bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions to the Bank.



Flow Chart of Japan's Grant Aid Procedures



Handwritten signatures and initials at the bottom right of the page.

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct building facilities	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others to the site)		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions to the Japanese bank for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)*
10	To accord Japanese nationals, whose services may be required in connection with the supply of the products and the services under the verified contract, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to pay)

*to be specified in the contract

MINUTES OF DISCUSSIONS
ON THE SECOND BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF SARDAR VALLABHBHAI PATEL POST
GRADUATE INSTITUTE OF PAEDIATRICS IN THE STATE OF ORISSA

In response to a request from the Government of India (hereinafter referred to as "India"), and based on the results of preliminary study conducted in July 2003, the Government of Japan decided to conduct a Basic Design Study on a Project for Improvement of Sardar Vallabhbhai Patel (hereinafter referred to as "S.V.P.") Post Graduate Institute of Paediatrics in the State of Orissa (hereinafter referred to as "the Project") and entrusted the Basic Design Study to the Japan International Cooperation Agency (hereinafter referred to as "JICA"). JICA sent to India the Basic Design Study Team and to follow up on this study, the Second Basic Design Study Team (hereinafter referred to as "the Team") was sent to India, headed by Mr. Takashi MATSUMOTO, Assistant Resident Representative, JICA India Office. The team stayed in the country from July 4 to 11, 2004.

The Team held discussions with the officials concerned of the State Government of Orissa, India and conducted a field survey in the study area.

In the course of discussions and field survey, both parties confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Bhubaneswar, 9 July, 2004

Takashi Matsumoto

Mr. Takashi Matsumoto
Leader
Basic Design Study Team
Japan International Cooperation Agency

R.N. Senapati

Mr. R.N. Senapati, I.A.S.
Commissioner-Cum-Secretary
Department of Health and Family Welfare
Government of Orissa

Aswini Kumar Mohanty

Dr. Aswini Kumar Mohanty
Superintendent
S.V.P. Post Graduate Institute of Paediatrics
Government of Orissa

ATTACHMENT

1. Interim Report

The team explained the Interim Report and the Indian side understood the contents of the report.

2. Items requested by the Indian Side

After discussions with the Team, the components of the facilities described in Annex-1 and the equipment described in Annex-2 were finally requested by the Indian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval. However, the final components of the Project will be decided after further review in Japan.

3. Schedule of the Study

3-1. JICA will prepare a draft report in English and dispatch another Team in order to explain its contents around October 2004.

3-2. In case that the contents of the report are accepted by the Indian side, JICA will complete the Basic Design Study Report and send it to India around January, 2005.

4. Other relevant issues

4-1. Contents of the Minutes of Discussions signed on 27 and 28 April 2004

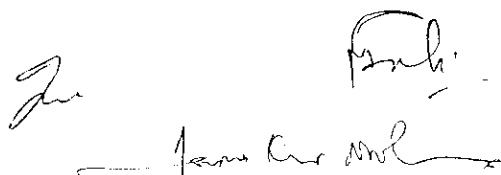
The Indian side and the Japanese side reconfirmed the contents of the Minutes of Discussions signed on 27 and 28 April 2004.

4-2. The State Government of Orissa committed to provide S.V.P Post Graduate Institute of Paediatrics with sufficient budget for operation and maintenance such as water and electricity charges, and costs for repairs, spare parts, reagents, consumables and annual maintenance contracts.

4-3. The State Government of Orissa promised to provide sufficient number of personnel -- medical, paramedical, and maintenance staffs etc., to operate and maintain the facilities and equipment provided by this Project.

4-4. S.V.P. Post Graduate Institute of Paediatrics also promised to allocate appropriate number of well-trained health personnel.

4-5. The State Government of Orissa and S.V.P. Post Graduate Institute of Paediatrics promised to ensure proper maintenance and full utilization of equipment and facilities.



Handwritten signatures and initials at the bottom of the page, including a large signature on the left and a smaller one on the right, with a line of text below them.

4-6. S.V.P. Post Graduate Institute of Paediatrics promised to take necessary measures, such as exemption of user charges for examination , diagnosis , ICU accommodation, utilization of equipment and so on, in deserving cases.

S.V.P. Post Graduate Institute of Paediatrics promised to submit to the Team a detailed implementation plan for the exemption of user charges along with a projected financial plan of the Institute by the end of July, 2004.


4-7. The Government of Orissa understands that warranty period of the equipment provided through the Project is one year and warranty is applicable only for problems caused by defect.

4-8. S.V.P. Post Graduate Institute of Paediatrics requested training on maintenance and management of the equipment.

4-9. Both sides confirmed that the specification of equipment and any other technical information shall not be released before the tender to be held in the implementation stage of the Project.

List of Annexes

- Annex-1 Facility Components of the Project
- Annex-2 List of Requested Equipment
- Annex-3 Necessary Measures to be Taken by the Indian Side


A. V. ...

Annex-1 Facility Components of the Project

OPD:	Either OPD Rooms or Emergency Dept.
	OT Rooms
Central Diagnostic Dept:	CSSD
	Image Diagnosis Rooms
	Laboratories
	NICU
	Newborn Bedroom
	Surgical Ward
Ward:	S. Doctor Rooms
	PICU
	M. Doctor Rooms
	Medical Ward
	Playroom
	Medical Gas Supply Facility
Incidental Facilities:	Electrical Room
	Waste Treatment Room
	Elevator

(Acronyms like "S.Doctor Rooms" and "M.Doctors Rooms" are unclear)

21

Handwritten signature
L. H. ...

Annex-2 List of Requested Equipment

(1) ICU (NICU, PICU)

S. No.	Name of Equipment	Requested Quantity
7	Automatic hand dryer	NICU-1, PICU-1.
25	Infusion Pump	Each ICU – 100% Of Bed
27	Low pressure continuous suction unit	NICU-2 PICU-2
28	Oxygen Analyzer	NICU-2, PICU-2.
29	Oxygen Head Box	(For Paediatrics and Neonatal) NICU-8, PICU-10
31	Phototherapy Unit (Double surface)	NICU-8
33	Radiant Heat Warmer	NICU-2, PICU-3, (SICU-1)
34	Syringe Pump	Each ICU – 80% of Beds
36	Bilirubinometer	NICU-1
38	Refrigerator	Each ICU-1
39	ICU Bed "NID-C"	PICU-17
41	Mobile Resuscitation Unit	NICU-1, PICU-1
54	Instrument Cabinet	Each ICU-1
56	Laryngoscope Set	Each ICU -100% of Beds
58	Ultrasonic Nebuliser	NICU-1, PICU-1
61	X-ray film viewer	NICU-2, PICU-2
62	Bedside multi-parameter monitor for PICU	1 for 1 Bed

63	Bedside multi-parameter monitor for NICU	1 for 1 Bed
65	Ventilator (Paediatric)	1 for 2 Beds, less Existing-1
66	Ventilator (Neonatal)	NICU- 60% of Beds
68	Defibrillator	PICU-1
69	Ambubag with face mask & Oxygen Reserver (For continuous manual ventilation are included)	Each ICU -100% of Beds
70	Emergency Cart	NICU-1, PICU-1

(2) New Born

S. No.	Name of Equipment	Requested Quantity
7	Automatic hand dryer	New Born-1
18	Apnea Monitor	New Born-10
23	Infant incubator, portable type	New Born
25	Infusion Pump	New Born- 50% of Beds
26	Neonate Monitor (Multi-parameter)	New Born -50%of Beds
28	Oxygen Analyzer	New Born-2
29	Oxygen Head Box	New Born-6
30	Perpex heat shield	New Born-30
31	Phototherapy Unit (Double surface)	New Born-10
33	Radiant Heat Warmer	New Born-20
34	Syringe Pump	New Born -40% of Beds
38	Refrigerator	New Born-1
41	Mobile Resuscitation Unit	New Born-1
54	Instrument Cabinet	New Born-1
55	IV-Stand	(40)

58	Ultrasonic Nebuliser	New Born-1
60	Electronic Weighing Scale for Paed & Infant	New Born-1
66	Ventilator (Neonatal)	New Born-1

(3) Imaging

S. No.	Name of Equipment	Requested Quantity
1	Automatic film processor	1
2	General X-Ray Machine	1
3	Manual film processing tank	1
4	Portable X-Ray Machine	1
21	Ultrasound guided biopsy kit for existing Ultrasound machine	1
22	ECHO cardio-graphic probe for 2D ECHO for existing Ultrasound machine	1
59	Ultrasonic diagnostic machine with additional Neonatal Probe	1
61	X-ray film viewer	10
80	CT Scanner(Spiral)	1
81	Protection materials against X-ray irradiation	2

(4) Laboratory

S. No.	Name of Equipment	Requested Quantity
20	Blood Gas Analyzer	1
35	Chemistry Auto Analyzer	1
36	Bilirubinometer	1
37	Micro centrifuge	1
46	Table Top Steam Sterilizer	1
73	Blood Cell Counter	1
74	Urine Analyzer	1
75	Coagulometer	1
76	Automatic Immunological Analyser	1
84	Blood Bank equipment	1

(5) O/T, Surgical Ward, CSSD

S. No.	Name of Equipment	Requested Quantity
6	Anesthesia apparatus	O/T-1
7	Automatic hand dryer	O/T-2

V.S.D.


8	Cold light source (ceiling type)	O/T-1
9	Cold light source (stand type)	O/T-2
10	Electric Surgery Apparatus	O/T-1
11	Major operation instrument set "NID-A"	O/T-3
12	Mayo instrument table	O/T-2
13	Minor operation instrument set "NID-B"	O/T-3
14	Operation Table	O/T-1
16	Suction Unit	O/T-2 Surgical Ward-1
17	Fogging machine for sterilization	O/T-1
25	Infusion Pump	O/T-2 Surgical Ward-2
26	Neonate Monitor (Multi-parameter)	O/T-1
32	Pulse Oximeter	O/T-1, Surgical Ward-1
34	Syringe Pump	Surgical Ward-2
40	Patient Bed	Surgical Ward-2
41	Mobile Resuscitation Unit	O/T-2
45	High-pressure Steam Sterilizer	CSSD-1
47	Working Table	CSSD-1
49	Fiberoptic Endoscope for Paediatric (Broncho)	Suregery-1 (Rigged type)
50	Fiberoptic Endoscope for Paediatric (Gastroscope)	Suregery-1
53	Infant Treatment Table	Surgical Ward-1
54	Instrument Cabinet	O/T-4
55	IV-Stand	(40)
56	Laryngoscope Set	O/T-2, Surgical Ward-2
57	Oxygen cylinder with flow meter	Surgical Ward-3
61	X-ray film viewer	O/T-2
68	Defibrillator	O/T-1

69	Ambubag with face mask & Oxygen Reserver	(For continuous manual ventilation are included) O/T-2, Surgical Ward-2
70	Emergency Cart	O/T-2, Surgical Ward-1
71	Wheel Chair	Surgical Ward-1
72	Stretcher	(with Trolley) O/T-1, Recovery-1, Surgical Ward-1
83	Laparoscopic Surgery Unit	O/T-1

(6) OPD, Casualty, Ward

S. No.	Name of Equipment	Requested Quantity
7	Automatic hand dryer	ID-1, New Ward-1, Old Ward-1
16	Suction Unit	OPD-1, Casualty-1, ID-1, New Ward-3, Old Ward-3
23	Infant incubator, portable type	Casualty-1
24	Infant Ventilator, portable type	Casualty-1, Ambulance-1
25	Infusion Pump	Each Ward for 2(8), less existing-2
32	Pulse Oximeter	Old Ward-2, New Ward-2, ID-2
34	Syringe Pump	Each Ward for 2(8), less existing-5
38	Refrigerator	OPD-1
40	Patient Bed	Old Ward-15, New Ward-17, ID-6
41	Mobile Resuscitation Unit	Casualty-1, Ambulance-1
43	Ambulance, Aircondition, Diesel	(Equipment Set for Ambulance are remain)
48	ECG	(Portable), Casualty-1
52	Electronic Height Scale for Paed. & Infant	Infant Length-OPD / Casualty Stand type- OPD / Casualty
53	Infant Treatment Table	Old Ward/ New Ward/ID/ Cabin/ Casualty/ OPD
54	Instrument Cabinet	OPD-1, Casualty-1
55	IV-Stand	(40)

56	Laryngoscope Set	Casualty-2, OPD-2, Each Wards-2 Less existing-4
57	Oxygen cylinder with flow meter	Each Ward for 3
58	Ultrasonic Nebuliser	Old Ward-1, New Ward-1, ID-2, Casualty-1
60	Electronic Weighing Scale for Paed & Infant	For Neonatal OPD-2 For Pead-6 OPD/ Casualty/ Old Ward/ New Ward/ ID
61	X-ray film viewer	OPD-2/Casualty-1
69	Ambubag with face mask & Oxygen Reserver	(For continuous manual ventilation are included) Casualty-2, OPD-2, Each Wards-2 Less existing-10
70	Emergency Cart	Casualty-1, ID-1, Old Ward-1, New Ward-1
71	Wheel Chair	Casualty-1, ID-1, Old Ward-1, New Ward-1, OPD-1
72	Stretcher	(with Trolley) Casualty-1, ID-1, Old Ward-1, New Ward-1, OPD-1


 L. R. M.

(7) Others

S. No.	Name of Equipment	Requested Quantity
5	LCD Projector	Training/ Administration-1
78	Microwave apparatus for biomedical waste management	Waste Management -1
79	Waste shredder	Waste Management -1
82	Oxygen Cylinder (Big)	Central Oxygen Supply System-24
	Medical Furniture	For new hospital building

Annex-3 Necessary Measures to be Taken by The Indian Side

1, To clear, level and reclaim the site.

(1) To cut trees and take out obstacles

(2) To fill appropriate soil in the site for construction

(3) To relocate open ditch in the site

2, To obtain Building Permit .

3, To take necessary Procedure for Counterpart Fund.

4, To bear the commissions to the bank for the banking services based upon the B/A.

5, To exempt Tax and custom clearance of the products at the port of disembarkation.

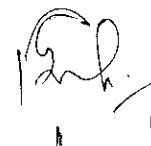
6, After completion of the construction and installation of the equipment.

(1) To provide general furniture

(2) To allocate sufficient staff to the Institute

(3) To allocate sufficient budget to the Institute

(4) To transfer existing Equipment



MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR IMPROVEMENT OF SARDAR VALLVBHAI PATEL POST
GRADUATE INSTITUTE OF PAEDIATRICS IN THE STATE OF ORISSA
(Explanation of Draft Report)

In April and July 2004, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Improvement of Sardar Vallvbhai Patel Post Graduate Institute of Paediatrics (hereinafter referred to as "the Institute") in the State of Orissa (hereinafter referred to as "the Project") to India, and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult the Government of India and the State Government of Orissa (hereinafter referred to as "the Indian side") on the components of the draft report, JICA sent to India the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Ms. Ako MUTO, Health Team, Project Management Group III, Grant Aid Management Department, JICA, from October 12 to 23, 2004.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

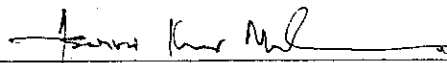
Bhubaneswar, 19 October, 2004
New Delhi, 21 October, 2004



Ms. Ako Muto
Leader
Draft Report Explanation Team
Japan International Cooperation Agency



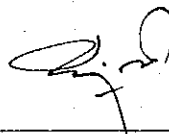
Mr. R.N. Senapati, I.A.S.
Principal Secretary
Department of Health and Family Welfare
Government of Orissa



Dr. Aswini Kumar Mohanty
Superintendent
S.V.P. Post Graduate Institute of Paediatrics
Government of Orissa



Mr. Prashant I.A.S.
Director
Department of Economic Affairs
Ministry of Finance
Government of India



Mr. Rajesh Bhushan, I.A.S.
Director, Department of Health
Ministry of Health and Family Welfare
Government of India

ATTACHMENT

1. Components of the Draft Report

The Indian side agreed and accepted in principle the components of the draft report explained by the Team.

2. Schedule of the Study

JICA will complete the final report in accordance with the confirmed item and send it to the Indian side around January 2005.

3. Other relevant issues

3-1 After discussing the Draft Report, the Indian side requested facilities and equipment described in Annex-1 and Annex-2. JICA will assess the appropriateness of the final request.

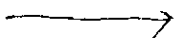
3-2 Both sides reconfirmed the contents of the Minutes of Discussions signed on 27 and 28 April 2004. Also, the Team and the Government of Orissa reconfirmed the contents of the Minutes of Discussions signed on 9 July 2004.

3-3 The Team emphasized strongly the necessity of collaboration among the departments of the Government of Orissa led by the Department of Health and Family Welfare in order to conduct the Government of Orissa's undertakings clarified in Annex-3. The Government of Orissa promised to take necessary action in suitable timing.

3-4 The Team and the Government of Orissa confirmed that the Government of Orissa should remodel the existing Institute buildings in order to realize the basic concepts of the Project written in the Draft Report.

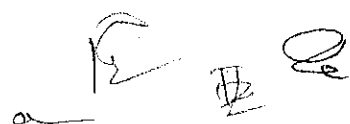
3-5 The Government of Orissa promised to provide sufficient number of staff to operate and maintain the facilities and equipment provided by the Project. The Government of Orissa also promised to make necessary budgetary provision for operation and maintenance cost of the Project.

3-6 The Team and the Government of Orissa confirmed that some ICU beds, which number is clearly mentioned in the Draft Report, should be free of charge in the point of compassion to the underprivileged people and the regulations for the free bed availability should be stated clearly in the bylaws of the User's Society and be observed severely.

3-7 The Team strongly recommended the improvement of existing drainage system and waste management system, and provision  for cleaning and sanitation of the campus of the Institute. The Government of Orissa promised to take necessary action promptly.

3-8 The Team and the Institute confirmed that the Institute should report the condition of facilities and equipment provided by the Project to the Embassy of Japan and JICA India Office every April for coming 5 years.

3-9 The Government of Orissa recognized the necessity of the consultant services for introduction of equipment management system, which was indicated in the Annex-5 of the Draft Report, as



one of the component of the Project.

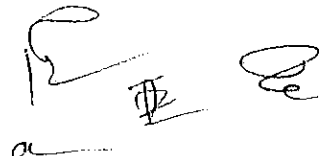
3-10 For utilization of the facility and equipment and the sustainability of the Project, the Government of Orissa recognized the necessity of technical cooperation in the field of hospital management, facility operation, and equipment maintenance. The Team introduced the way of technical cooperation and explained that other official requests should be submitted through diplomatic channels such as the Embassy of Japan and JICA India Office. The Government of Orissa understood the above and promised to take actions in necessary cases.

Enclosures

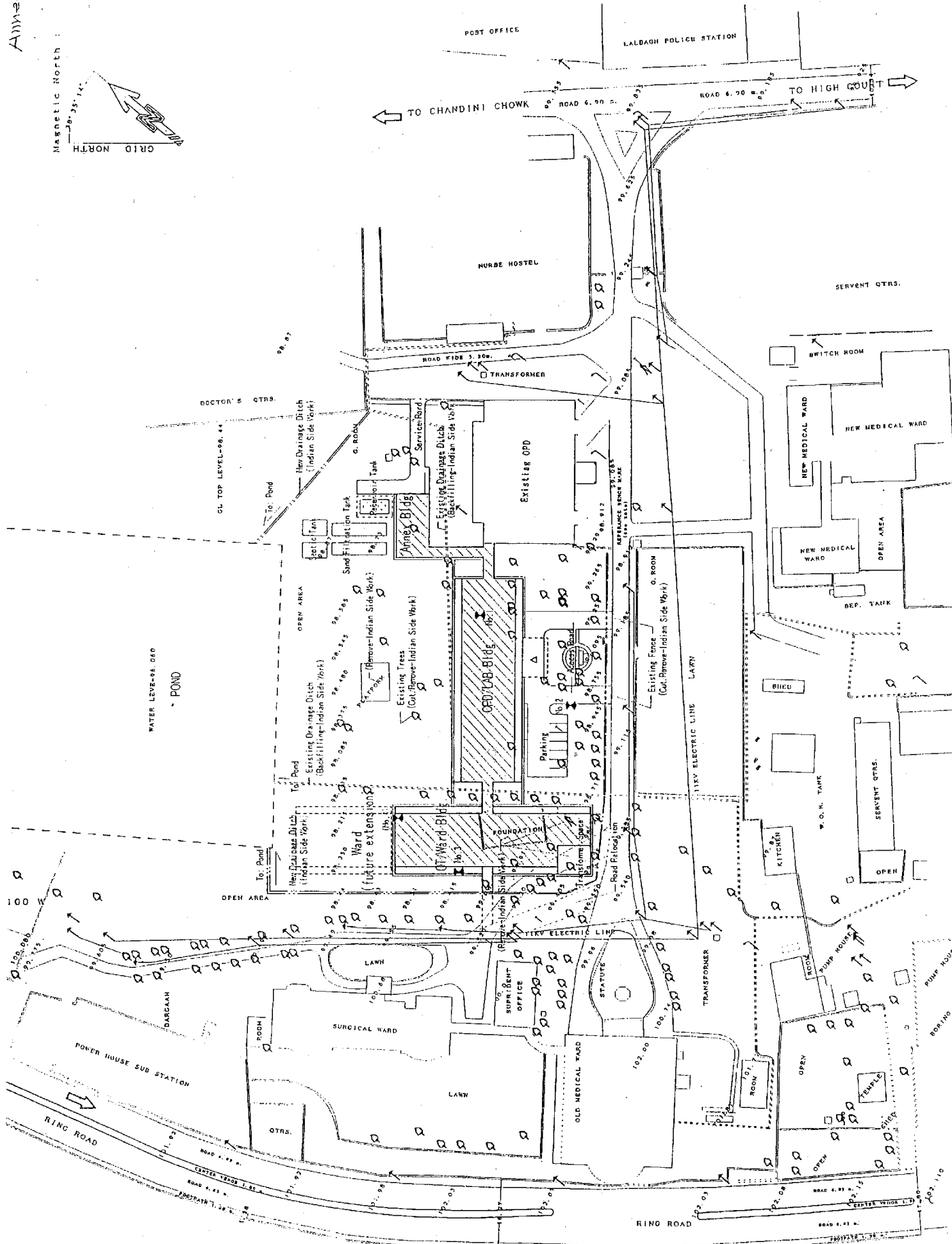
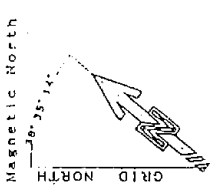
Annex-1: Facility Plan

Annex-2: Equipment List

Annex-3: Undertakings by the Government of Orissa

Handwritten signature and initials in the bottom right corner of the page.

Annex - 1



A-1-1

[Handwritten signatures and initials]

Remarks: Position of Border
Dist. Bldg. S. 17/1000

Annex Bldg.

EXISTING OPD

Minor modifications to secure a doctor's duty room and nurse changing space in the ICU section will be added to this plan.

OT Ward Bldg.

OPD/LAB Bldg.

NICU 9B

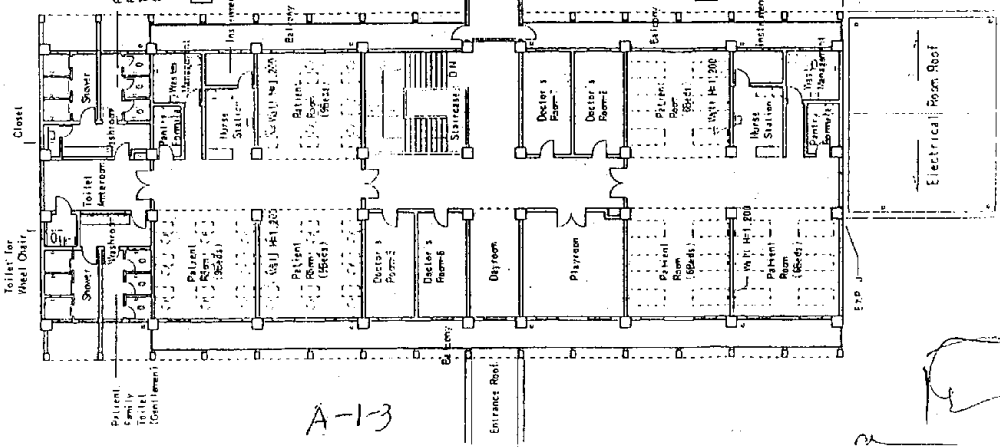
PICU 12B

Doctor's Room

Newborn 308ed

Medical Ward 188ed

Medical Ward 188ed



First Floor Plan

A-13

Handwritten initials and a signature are present at the bottom right of the page. The initials appear to be 'J' and 'R' or similar, and there is a signature that is partially legible as 'J. R. ...'.

Equipment Schedule

Equipment No.	Equipment Component No.	Equipment Name	Unit	Qty	Breakdown																	
					NICU	PICU	Newborn	Imaging	Lab	OT	CSSD	OPD	Casualty	Medical Ward I	Medical Ward II	Surgical Ward	ID Ward	Others				
2	2	General X-ray machine (300mA)	nos.	1				1														
3	3	Manual film processing tank	set	1				1														
4	4	Portable X-ray machine	nos.	1				1														
5	5-1	LCD Projector	nos.	1																		1
	5-2	Computer for LCD Projector	nos.	1																		1
6	6	Anesthesia apparatus	nos.	1						1												
7	7	Automatic hand dryer	nos.	5	1	1	1			1												1
8	8	Cold light source (Ceiling type)	nos.	1						1												
9	9	Cold light source (Stand type)	nos.	2								1										
11	11	Major operation instrument set "NID-A"	set	3						3												
12	12	Mayo instrument table	nos.	1						1												
13	13	Minor operation instrument set "NID-B"	set	3						3												
14	14	Operation table	nos.	1						1												
16	16-1	Suction unit (Applicable to medical pipe system)	nos.	37	9	12	15			1												
	16-2	Suction unit (Electric)	nos.	9								2	1	2	2	1	1					
18	18	Apnea monitor	nos.	6			6															
20	20	Blood gas analyzer (with electrolyte analyzer)	nos.	1						1												
23	23	Infant incubator, portable type	nos.	2			1							1								
25	25	Infusion pump	nos.	22	9	12				1												
27	27-1	Low pressure continuous suction unit (Applicable to medical pipe system)	nos.	2	1	1																
	27-2	Low pressure continuous suction unit (Electric)	nos.	2	1	1																
28	28	Oxygen analyzer	nos.	3	1	1	1															
29	29	Oxygen hood box	nos.	6	2	2	2															
30	30	Perplex heat shield	nos.	21			21															
31	31-1	Phototherapy unit (upper part exposure)	nos.	16	7		9															
	31-2	Phototherapy unit (lower part exposure)	nos.	16	7		9															

Equipment No.	Equipment Component No.	Equipment Name	Unit	Qty	Breakdown																
					NICU	PICU	Newborn	Imaging	Lab	OT	CSSD	OPD	Casualty	Medical Ward I	Medical Ward II	Surgical Ward	ID Ward	Others			
		part exposure)																			
33	33	Radiant heat warmer	nos.	21	9	3	9														
34	34	Syringe pump	nos.	13	6	7															
35	35	Chemistry auto analyzer	nos.	1					1												
37	37	Micro centrifuge	nos.	1					1												
38	38	Refrigerator	nos.	13	1	1	2				2	1	2	1	1	1	2				
39	39	ICU Bed "NID-C"	nos.	9		9															
40	40-1	Patient bed (large)	nos.	26										18		8					
	40-2	Patient bed (small)	nos.	39										27		12					
41		Mobile resuscitation unit	nos.	2			1						1								
43	45-1	High pressure steam sterilizer	nos.	1							1										
	45-2	Water softener	nos.	1							1										
46	46	Table top steam sterilizer	nos.	1					1												
47	47	Work table for CSSD (stainless steel)	nos.	1							1										
48	48	ECG (portable) 3 channels	nos.	1									1								
49	49	Fiberoptic endoscope for paediatric (Boncho)	set							1											
52	52-1	Electronic height scale (Infant)	nos.	3								2	1								
	52-2	Electronic height scale (Paed.)	nos.	3								2	1								
53	53	Infant treatment table	nos.	3								2	1								
54	54	Instrument cabinet	nos.	9	1	1	2			2		2	1								
	55	IV stand	nos.	77			21					2	1	23	8	10	12				
56	56-1	Laryngoscope handle for Neonatal	nos.	5	3					1			1								
	56-2	Laryngoscope handle for Paed.	nos.	10		3				1			1	1	1	1	2				
	56-3	Laryngoscope Blade set (Miller type)	set	10	6					2			2								
	56-4	Laryngoscope Blade set (Macintosh type)	set	20		6				2			2	2	2	2	4				
58	58	Ultrasonic nebulizer	nos.	8	1	1	1						1	1	1						2
59	59	Ultrasonic diagnostic machine with additional neonatal probe	nos.	1					1												
60	60-1	Electronic weighing scale (Infant)	nos.	3			1					2									
	60-2	Electric weighing scale	nos.	8								2	1	2	1		2				2

Equipment No.	Equipment Component No.	Equipment Name	Unit	Qty	Breakdown																
					NICU	PICU	Newborn	Imaging	Lab	OT	CSSD	OPD	Caesaly	Medical Ward I	Medical Ward II	Surgical Ward	ID Ward	Others			
		(Paed.)																			
61	61-1	X-ray film viewer (stand type)	nos.	6	1	1	2	1		1											
	61-2	X-ray film viewer (table top)	nos.	12	1	1	2	1				6	1								
62	62	Bedside monitor (5 parameters)	nos.	23	9	12				1								1			
65	65	Ventilator (Paediatric)	nos.	3		2							1								
66	66	Ventilator (Neonatal)	nos.	3	3																
68	68	Defibrillator	nos.	2		1				1											
69	69-1	Ambubag for Neonatal	nos.	8	6								2								
	69-2	Ambubag for Paed.	nos.	18		6							2	2	2	2	2	4			
70	70	Emergency cart	nos.	10	1	1				1			1	2	1	1	1	2			
71	71	Wheel chair	nos.	8								2	1	2	1	1	1				
72	72	Stretcher (with trolley)	nos.	9						3		2	1	2	1	1	1				
73	73	Blood cell counter (18 parameters)	nos.	1						1											
78	78	Microwave apparatus for biomedical waste management	nos.	1																	1
79	79	Waste shredder	nos.	1																	1
81	81	Protection materials against X-ray irradiation	set	1					1												
82	82	Oxygen cylinder (big)	piece	24																	24
Ad-1		Oxygen flow meter (Applicable to medical pipe system)	nos.	37	9	12	15			1											
Ad-2		Washing machine with drier (for CSSD)	nos.	2							2										
Ad-3		Baby cod	nos.	21		21															
Ad-4		Examination table	nos.	5								5									
Ad-5	Ad-5-1	Refrigerator	nos.	1						1											
	Ad-5-2	Deep freezer	nos.	1						1											
	Ad-5-3	Cold box	nos.	2						2											
Ad-6		Hand washing water sterilizer	nos.	1						1											
Ad-7	Ad-7-1	Examination table (doctor)	nos.	6								6									
	Ad-7-2	Chair (doctor)	nos.	6								6									
	Ad-7-3	Rotary chair (patient)	nos.	6								6									
	Ad-7-4	Desk for nurse station	nos.	7	1	1	1			1					2		1				
	Ad-7-5	Chair for nurse station	nos.	14	2	2	2			2					4		2				

[Handwritten signature and initials]

Equipment No.	Equipment Component No.	Equipment Name	Unit	Qty	Breakdown													
					NICU	PICU	Newborn	Imaging	Lab	OT	CSSD	OPD	Casualty	Medical Ward I	Medical Ward II	Surgical Ward	ID Ward	Others
	Ad-7-6	Loading Trolley	nos.	2							2							
	Ad-7-7	Sterilization drum - set	set	2							2							
	Ad-7-8	Laundry Cart	nos.	4							4							
	Ad-7-9	Medicine trolley	nos.	9	1	1	1						2	1	1	2		
	Ad-7-10	Chair (patient family)	nos.	86	9	12	30						46		20			
	Ad-7-11	Stainless steel sink unit (small), single sink	nos.	5				1		1			2		1			
	Ad-7-12	Stainless steel sink unit (medium), single sink	nos.	5	1		1						2		1			
	Ad-7-13	Stainless steel sink unit (medium), double sink	nos.	1					1									
	Ad-7-14	Stainless steel sink unit (large), double sink	nos.	3	1	1	1											
	Ad-7-15q	Stainless steel sink/hand wash (large)	nos.	1							1							
	G	Stainless steel sink/hand wash (medium)	nos.	1						1								
	Ad-7-18	Work table, wall type (C-shape) with sink	nos.	1					1									
	Ad-7-19	Work table, wall type (L-shape) with sink	nos.	1					1									
	Ad-7-20	Work table, wall type (large) with sink	nos.	1					1									
	Ad-7-21	Work table, wall type (medium) with sink	nos.	1					1									
	Ad-7-22	Lab work table (large)	nos.	2					2									
	Ad-7-23	Lab work table (medium)	nos.	1					1									
50	50	Fiberoptic Endoscope for Paediatric (Gastroscope)	nos.	1						1								
26	26	Neonatal monitor (Pulse Oximeter)	nos.	5			5											

Undertakings by the Government of Orissa

1. Site Preparation

(1) Removal of Obstacles

- 1) Toilet foundation (11m x 17m)
- 2) Borehole(1nos.)
- 3) Part of campus road(approximately 126m²)

(2) Trees and bushes (26 nos.)

(3) Rerouting of open sewage ditches

- 1) Excavation of new ditch
- 2) Burying the existing ditches

2. Remodelling of the Existing Buildings

(1) Old Medical Ward

- 1) Interior wall repainting(approximately 1,048m²)
- 2) Equipment maintenance shop repairs

(2) Existing Surgical Ward

- 1) Interior wall repainting (approximately 1,280m²)
- 2) OT room renewal

(3) OPD Ward: connection corridor (unused toilet) renewal

- 1) Concrete (approximately 4 m³)
- 2) Mortar finish: floor (approximately 12m²)
- 3) Mortar finish: wall (approximately 48m²)
- 4) Painting: wall (approximately 48m²)
- 5) Painting: ceiling (approximately 12m²)
- 6) Wall demolishing (2 nos.)

(4) New Medical Ward

- Interior painting (approximately 1,640m²)

3. Planting

- (1) Turf (approximately 1,500m²)
- (2) Bush (Height: 1.0m) (70 nos.)

6. 事業事前計画表（基本設計時）

1. 案件名
インド国 サルダール・バルバイ・パテル小児医療教育病院整備計画
2. 要請の背景（協力の必要性・位置付け）
<p>インド国は保健指標を近隣諸国のバングラデシュ、ネパール、パキスタンなどと比較した場合、5歳未満児死亡率、出生時の平均余命、予防接種接種率および合計特殊出生率などでは同等の値であるが、乳児死亡率は最も高い。オリッサ州の保健指標はインド国平均に比べても更に低く、特に乳児死亡率はインド全土で最も悪い値である。オリッサ州においては保健医療分野の全般的な改善が必要であり、特に小児医療分野の改善が重要課題である。</p> <p>この現状を改善すべく、オリッサ州政府保健部は「オリッサビジョン 2010」を策定し、乳児死亡率の減少を主要目標の一つに掲げ努力している。</p> <p>サルダール・バルバイ・パテル小児医療教育病院（以降本病院と称する）は、小児医療に関するオリッサ州の公的トップレファラル病院であると共に同州の医科大学大学院生に対しての小児医療教育も行っている。本病院は200年以上前に当時の総督邸として建設された建物を病棟に転用し、外来診療棟を増築することで1960年代に小児病院として運営を開始し、増築を重ね、現在は200床の小児病院として運営されている。しかし建物が分散配置されていること、必要機材が不足していると共に更新の必要な老朽機材が多いことなどから、適切で効率的な医療サービスの提供に支障をきたしている。また、施設・機材の質的・量的不備のために意図する教育ができない状況である。</p> <p>このような本病院の状況を改善するために、オリッサ州政府保健部は、本病院の施設・機材の改善計画を策定し、日本国政府に同計画に対する無償資金協力を要請した。日本国政府は、無償資金協力案件として、本病院の施設・機材の改善計画のうち、新設建物を建設して機能が分散している諸室を集約すると共に必要な医療機材を供与する必要性は高く、協力実施の妥当性が高いことを認識した。</p>
3. プロジェクト全体計画概要
<p>(1)プロジェクト全体計画の目標</p> <p>本病院の提供する小児医療サービスが改善すると共に、その医療サービスの実践を通して行われる大学院教育が充実する。</p> <p>裨益対象の範囲及び規模：インド国オリッサ州住民 約 35,000,000 人</p> <p>(2)プロジェクト全体計画の成果</p> <p>ア．<u>本病院の施設／機材が整備される。</u></p> <p>イ．本病院の運営体制が整備される。</p> <p>(3)プロジェクト全体計画の主要活動</p> <p>ア．<u>本病院の施設／機材を整備する。</u></p> <p>イ．<u>機材管理システム構築のための技術訓練を実施する。</u></p> <p>ウ．上記施設・機材を使用して医療サービスを提供すると共に大学院教育を行う。</p> <p>(4)投入（インプット）</p> <p>ア．<u>日本側：無償資金協力 8.35 億円</u></p> <p>イ．相手国側</p> <p>必要な人員の確保</p> <p>現有要員に加えて、ICU 及び新生児病棟の看護婦長 1 名、看護婦 16 名、看護補助 16 名および機材管理要員として技術者を 1 名追加雇用する。</p>

<p>②既存棟の改修および植栽工事</p> <p>③施設・機材の運営維持に係る経費</p> <p>(5)実施体制</p> <p>実施機関：サルダール・バルバイ・パテル小児医療教育病院</p> <p>主管官庁：インド国オリッサ州政府保健家族福祉部</p>								
<p>4. 無償資金協力案件の概要</p>								
<p>(1)サイト</p> <p>オリッサ州カタック市サルダール・バルバイ・パテル小児医療教育病院敷地内</p> <p>(2)概要</p> <p>ア. 本病院敷地内に新設建物として外来・検査棟 (RC 造 2 階建て、約 1,655 m²)、手術・病棟 (RC 造 2 階建て、約 1,491 m²)、付属棟 (RC 造平屋建て、約 110 m²)、延床面積約 3,256 m²を建設する。</p> <p>イ. 医療機材の調達</p> <p>上記新設建物および既存建物の ICU 病棟、新生児病棟、一般病棟、外来・検査部門、手術部門に対して医療機材を調達する。</p> <p>ウ. 機材管理要員および病院スタッフを対象に、機材管理システム構築のための技術指導を行う。</p> <p>(3)相手国側負担事項</p> <p>建設予定地の整地工事</p> <p>(4)概算事業費</p> <p>概算事業費 8.42 億円 (無償資金協力 8.35 億円、インド国側負担 0.07 億円)</p> <p>(5)工期</p> <p>詳細設計・入札期間を含め、約 18 ヶ月(予定)</p> <p>(6)貧困、ジェンダー、環境および社会面の配慮</p> <p>ア. ICU においては現在、全入院患者が入院費および機材使用料を支払うことが原則であるため、貧困層の患者は入院すらできなかったが、本計画においては ICU に無料病床が確保されるため、貧困者カードを有す貧困層の救済が図れる。</p> <p>イ. 現在、本病院の医療廃棄物は、敷地内に穴を掘り焼却しているが、本計画において医療廃棄物用の電磁波滅菌装置および破砕器を導入し、当地の環境基準に合致する医療廃棄物処理が可能となる。</p>								
<p>5. 外部要因リスク (プロジェクト全体計画の目標の達成に関するもの)</p> <p>・ サイクロン、地震などの甚大な自然災害が起きない。</p>								
<p>6. 過去の類似案件からの教訓の活用</p> <p>特になし。</p>								
<p>7. プロジェクト全体計画の事後評価に係る提案</p>								
<p>(1)プロジェクト全体計画の目標達成を示す成果指標</p> <table border="1"> <thead> <tr> <th>指標</th> <th>現状(2003-04)</th> <th>プロジェクト後(2007-08)</th> </tr> </thead> <tbody> <tr> <td>ICU 入院患者数(人)</td> <td>381</td> <td rowspan="2">増加する</td> </tr> <tr> <td>下位医療機関からのリファー数(件)</td> <td>3,895</td> </tr> </tbody> </table> <p>(2)その他の成果指標</p> <p>特になし。</p> <p>(3)評価のタイミング</p> <p>2007 年度 (2007-08 年) 以降 (施設・機材稼動開始後 1 年経過以降)</p>	指標	現状(2003-04)	プロジェクト後(2007-08)	ICU 入院患者数(人)	381	増加する	下位医療機関からのリファー数(件)	3,895
指標	現状(2003-04)	プロジェクト後(2007-08)						
ICU 入院患者数(人)	381	増加する						
下位医療機関からのリファー数(件)	3,895							

調査名 インド国サルダール・バルパイ・パテル小児医療教育病院整備計画

番号	名 称	形態 図書・ビデオ 地図・写真集	オリジナル・コピー	発 行 機 関	発行年
1	The Environment (Protection) Act, 1986 (29 of 1986)	図書	オリジナル	Universal Law Publishing Co., Pvt. Ltd.	2004 年
2	The Environment (Protection) Act, 1986 and Rules Thereunder	図書	オリジナル	オリッサ州公害防止局	1998 年
3	Labour Laws	図書	オリジナル	Nabhi Publications	2004 年
4	Orissa Health System Development Project Bid Documents Vo. III Bill of Quantities for New Construction, One Time Repair and Renovation of Capital Hospital Bhubaneswar	図書	オリジナル	Architects Team Consultants	---
5	Orissa Health System Development Project Bid Documents Vo. I to Vo. IV for Proposed Interior/Civil Works to Health Information Resource Center at Capital Hospital Bhubaneswar	図書	オリジナル	M/S Architects & Associates	---
6	Orissa Health Systems Development Project (World Bank Assisted) Manual on Hospital Waste Management	図書	オリジナル	オリッサ州政府	2001 年
7	Orissa Health Sector Reform Draft Action Plan for Year-1 (Based on Orissa Health Policy and Strategy adopted by the Government of Orissa in 2003)	図書	オリジナル	オリッサ州保健家族福祉部	2003 年
8	Orissa Development Authorities Manual Orissa Law Reviews	図書	オリジナル	Orissa Court Reviews	2003 年

番号	名 称	形態 図書・ビデオ 地図・写真集	オリジナル・コピー	発行機関	発行年
9	Bulletin SCB Medical College & Hospital	図書	オリジナル	SCB Medical College & Hospital	2003 年
10	Lady Hardinge Medical College & Associated Hospitals New Delhi Annual Report 2002	図書	オリジナル	Lady Hardinge Medical College	2003 年
11	Organization of a Special Care Neonatal Unit	図書	コピー	---	---
12	Norms for Accreditation of Level II Special Care Neonatal Units	図書	プリント	National Neonatology Forum	1991 年
13	Norms for Accreditation of Level III Special Care Neonatal Units	図書	プリント	National Neonatology Forum	1998 年
14	Cuttack Development Authority (Planning and Building Standards) Regulations, 2001	図書	オリジナル	Cuttack Law Review	2004 年
15	Guidelines for Setting Up Blood Storage Centres at First Referral Units	図書	コピー	オリッサ州保健家族福祉部	2003 年
16	建築確認申請用の提出図面	図書	コピー	---	---
17	Code of Practice for Installation and Maintenance of Internal Fire Hydrants and Hose Reels on Premises (First Revision)	図書	コピー	Bureau of Indian Standards	1990 年
18	Fire Protection Manual (Internal Appliances, Fire Engines, Trailer Pumps and Hydrant Systems)	図書	コピー	Tarif Advisory Committee	1998 年
19	National Accounts Statistics 2003	図書	オリジナル	中央統計局	2003 年
20	Road Guide to Orissa , Bhubaneshwar Delhi	地図	オリジナル	TKK Healthcare Ltd.	---

8 . その他の資料・情報

8-1 ICU 病床数の算定法

1) 計算の前提条件

- a) ICU では瀕死の重篤患者のケアを行う。瀕死の重篤患者とは、医師により ICU でのケアが必要と判断される患者を言う。
- b) ICU ケアは原則として有料とする。ただし貧困者に対しては受益者負担費を流用して負担の軽減または免除を行い、全ての重篤患者を受け入れることとする。(そのための制度を確立する)
- c) 計算には次の統計をもちいる。 現地調査期間中に院長から提供された 2003 年 7 月から 2004 年 5 月までの ICU 患者統計、 質疑回答書に示された 2003 年 4 月から 2004 年 3 月までの全体患者統計、及び 現地調査期間中に外科医長から提供された 2004 年 5 月までの過去十数ヶ月間の外科の患者統計。

2) ICU 計画病床数の計算

a) 計算基本式

(計画病床数) = (必要病床数) ÷ (計画病床利用率)

(必要病床数) = (重篤患者数) × (平均在室日数) ÷ 365 日 × 1 床/人

(計画病床利用率) = 需要変動を克服して計画患者数を確保するために必要な病床数のゆとり。本計画では 90% に設定する。

b) 必要病床数の計算

基本式

(必要病床数) = (重篤患者数) × (平均在室日数) ÷ 365 日 × 1 床/人

重篤患者数の計算式

ICU ケアが必要な重篤患者とは、医師によって重篤であると判断されて実際に ICU でケアされた患者、及び重篤であったが何らかの理由で ICU ケアを受けられなかった患者の和であるから、次のように表すことができる。

(重篤患者数) = (ICU ケアを受けた重篤患者数)
+ (ICU 以外でケアされた重篤患者数)

c) 内科の ICU 病床数

ICU ケアを受けた内科の重篤患者数

2003 年 ~ 2004 年における 10 ヶ月間の実績統計によれば、新生児 165 人 (死亡 82 人、生還 83 人)、小児 216 人 (死亡 70 人、生還 146 人) であり、年間ではそれぞれ次のように計算される。

/ 新生児.....165 × 12/10 = 198 人

/ 乳児・小児.....216 × 12/10 = 259 人

ICU 以外でケアされた内科の重篤患者数

(ICU 以外でケアされた内科の重篤患者数)
= (ICU 以外でケアされた内科の重篤患者死亡数)
+ (ICU 以外でケアされた内科の重篤患者生還数)

であるから、ICU 以外で死亡した内科の重篤患者の死亡数と死亡率がわかれば

(ICU 以外でケアされた内科の重篤患者数)

$$= (\text{ICU 以外でケアされた内科の重篤患者死亡数}) \div (\text{当該死亡率})$$

と表現できる。

ここで、ICU 以外でケアされた重篤患者死亡数は(死亡患者総数) - (ICU 死亡患者数) であり、次のように計算される。

/ 新生児の場合

$$\text{総死亡者数} = 344$$

$$\text{外科患者と内科患者の割合} = 606 : (8045 - 606) = 7.5 : 92.5$$

$$\text{内科死亡患者数} = 344 \times 0.925 = 318 \text{ 人}$$

$$\text{ICU 以外での死亡重篤患者数} = 318 \text{ 人} - 82 \times 12/10 = 220 \text{ 人}$$

/ 乳児・小児の場合

$$\text{総死亡者数} = 380$$

$$\text{外科患者と内科患者の割合} = 606 : (8045 - 606) = 7.5 : 92.5$$

$$\text{内科死亡患者数} = 380 \times 0.925 = 352 \text{ 人}$$

$$\text{ICU 以外での死亡重篤患者数} = 352 \text{ 人} - 70 \times 12/10 = 268 \text{ 人}$$

ICU における重篤患者の死亡率は、上記 に挙げた実績統計値より、新生児 = 50%、乳児・小児 = 33%と計算されるが、ICU 以外でケアされた重篤患者の死亡率はそれよりずっと高いはずである。ただしこの死亡率を推計する統計資料がないため、病院との協議の中で新生児 80%、乳児・小児 60%と設定することに合意した。この場合、ICU 以外でケアされた重篤患者数は以下のとおり計算される。

$$\text{/ 新生児} \dots\dots\dots 220 \text{ 人} \div 0.8 = 275 \text{ 人}$$

$$\text{/ 乳児・小児} \dots\dots\dots 268 \text{ 人} \div 0.6 = 447 \text{ 人}$$

重篤患者総数

上記 より以下のとおり求められる。

$$\text{/ 新生児} \dots\dots\dots 165 \text{ 人} + 275 \text{ 人} = 440 \text{ 人}$$

$$\text{/ 乳児・小児} \dots\dots\dots 259 \text{ 人} + 447 \text{ 人} = 706 \text{ 人}$$

ICU における平均在室日数

2003 年 7 月から 2004 年 5 月までの統計では、ICU における滞在日数の平均値は以下のとおりである。

$$\text{新生児} \dots\dots\dots \text{生還患者} = 7.3 \text{ 日}$$

$$\text{乳児・小児} \dots\dots\dots \text{生還患者} = 6.8 \text{ 日}$$

$$\text{死亡患者} = 5.0 \text{ 日}$$

$$\text{死亡患者} = 2.7 \text{ 日}$$

これより新生児と乳児・小児のそれぞれの平均在室日数を加重平均で求めると以下のとおりである。

$$\text{/ 新生児} = (7.3 \times 83/165 + 5.0 \times 82/165) = 6.2 \text{ 日}$$

$$\text{/ 乳児・小児} = (6.8 \times 146/216 + 2.7 \times 70/216) = 5.5 \text{ 日}$$

必要病床数

以上より必要病床数は、上記 b) の基本式に上記 を代入して次のとおり求められる。

$$(\text{必要病床数}) = (\text{重篤患者数}) \times (\text{平均在室日数}) \div 365 \text{ 日} \times 1 \text{ 床/人}$$

$$\text{/ 新生児} \dots\dots\dots 440 \text{ 人} \times 6.2 \text{ 日} \div 365 \text{ 日} \times 1 \text{ 床/人} = 7.5 \text{ 床}$$

$$\text{/ 乳児・小児} \dots\dots\dots 706 \text{ 人} \times 5.5 \text{ 日} \div 365 \text{ 日} \times 1 \text{ 床/人} = 10.6 \text{ 床}$$

d) 外科の ICU 病床数

患者統計 (2004 年 5 月より過去十数ヶ月のサンプル統計)

患者の分類		統計患者数	補正患者数	
手術患者	新生児	120 時間 ICU ケア必要患者	78	64
		その他	97	79
		合計	175	143
	乳児・小児	24 時間 ICU ケア必要患者	132	108
		その他	336	273
		合計	468	381
合計		643	524	
非手術患者		100	82	
合計		743	606	

補正患者数 = 2003-04 年における 1 年間の外科の入院患者数は 606 人であり、上記のサンプルは 1 年間の入院患者数を上回っており、1 年を超える期間の統計値である。そこで 1 年の値に換算した場合の患者数

重篤患者総数

上表より 1 年間の推計重篤患者数は次のとおりである。外科には ICU がいないため、全ての重篤患者は ICU 以外 (一般病室) で看護された。

/ 新生児..... 64 人
/ 乳児・小児..... 108 人

ICU における平均在室日数

上表の必要ケア時間に入れ替えや準備等の 1 日を加えて次のとおり求められる。

/ 新生児..... 120 時間/24 時間 + 1 = 6 日
/ 乳児・小児..... 24 時間/24 時間 + 1 = 2 日

必要病床数 = (重篤可能患者数) × (平均在室日数) ÷ 365 日 × 1 床/人

/ 新生児..... 64 人 × 6 日 ÷ 365 日 × 1 床/人 = 1.1 床
/ 乳児・小児..... 108 人 × 2 日 ÷ 365 日 × 1 床/人 = 0.6 床

外科に必要な病床数は少ないのでこれを内科と別個に維持するのは極めて非効率的である。そこで外科の ICU 病床は内科の ICU に確保し、日常の利用・管理は共同で行うこととする。

e) 計画病床数

上記 c) 、及び d) より外科と内科を合わせた計画病床数は以下のとおりである。

/ 新生児..... 7.5 床 + 1.1 床 = 8.6 床 9 床
/ 乳児・小児..... 10.6 床 + 0.6 床 = 11.2 床 12 床

8-2 新生児病床数の算定法

1) 計算の前提

全ての新生児患者は、外科の患者を含めて、新生児病室またはNICUにおいてケアできる病床数を設定する。ICUの患者を含めて外科の新生児患者の予後を外科の一般病床でケアするか、新生児病棟でケアするかは専門医の判断に委ねる。

2) 新生児病床数の計算

a) 基本式

新生児病棟の計画病床数は以下のとおり計算される。

$$(\text{計画病床数}) = (\text{新生児患者用総病床数}) - (\text{NICU 病床数})$$

ここで、

$$(\text{新生児患者用総病床数}) = (\text{新生児入院患者総在室数}) \div 365 \text{ 日} \div (\text{計画病床利用率})$$

$$\text{NICU 病床数} = 9 \text{ 床}$$

(計画病床利用率) = 需要変動を克服して計画患者数を確保するために必要な病床数のゆとりをもたせるための係数。本計画では90%に設定する。

b) 新生児入院患者総在室数

新生児入院患者総在室数は次式で求められる。

$$(\text{新生児入院患者総在室数}) = (\text{新生児入院患者生還者数}) \times (\text{生還者平均在院日数}) \\ + (\text{新生児入院患者死亡者数}) \times (\text{死亡者平均在院日数})$$

ここで、

平均在室日数は各病棟の昨年来の実績値を採用して死亡患者の場合 = 4.4 日、生還患者の場合は = 10.5 日とする。

$$\text{新生児死亡患者数} = 344 \text{ 人}$$

$$\text{新生児生還患者数} = (\text{新生児入院患者数}) - (\text{新生児死亡患者数})$$

$$= 1,418 - 344 \text{ 人} = 1,074 \text{ 人}$$

以上より、新生児入院患者総在室数は上の式に を代入して以下のとおり求められる。

$$1,074 \text{ 人} \times 10.5 \text{ 日} + 344 \text{ 人} \times 4.4 \text{ 日} = 12,790 \text{ 人日}$$

c) 新生児患者用総病床数は a) 式より以下のとおり求められる。

$$= 12,790 \text{ 人日} / 365 \text{ 日} \times 1 \text{ 床} / \text{人} \div 0.9 = 38.9 \text{ 床} \quad 39 \text{ 床}$$

従って新生児病棟病床数は a) の基本式より 39 床 - 9 床 = 30 床 (外科を含む)

8-3 受益者負担費料金表

2004年7月現在

<u>HEMATOLOGY</u>	単位 比 -
Differential count	10
Total Platelet Count	10
Total White cell count	10
Sickling	20
Haemoglobin	05
Packed cell volume	10
Reticulocyte count	20(10)
Malaria Test	10
Microfilaria	10
Bleeding time	05
Cloting time	05
Malaria PF/PV	170
ESR	10
PS comment	10
<u>SEROLOGY</u>	
VDRL	20
Widal	40
ASO	50
CRP	50
Mycodot	80
G6 PD	70
Australia Antigen	50
<u>BIOCHEMISTRY</u>	
FBS	20
PPBS	20
Urea	20
Creatinine	20
Cholesterol	20
Protein	20
Albumin	20
SGOT	20
SGPT	20
Alkaline Phosphate	20
Billirubin	20
Sodium	20
Potassium	20
Phosphorus	30
Calcium	30
<u>CYTOLOGY</u>	
Sputum AFB	20
GM stain	20
Throat swab GM stain	20
Albert stain	20
Nasal smear LS stain	20
GM stain	20
Fluid cytology	30
Fluid Chemical Analysis (Sugar Protein)	50

<u>RADIOLOGY</u>	単位 比 -
X-Ray (6"1/2 x 8"1/2)	40
X-Ray (8" x 10")	40
X-Ray (10"x12")	50
Barium Meals (1st Film)	50
(extra Film)	40
X-Ray Portable	100
ECCG	50
Ultrasound	150
Ultrasound with Photo	200
<u>URINE ANALYSIS</u>	
Routine test	10
Bile Salt	10
Bile pigment	10
Urobilinogen	10
Ketonebodies	10
Chyle	10
24 hrs. Urine protein	20
<u>STOOL ANALYSIS</u>	
Routine test	10
Occult blood	10
Sugar	10
<u>OTHERS</u>	
Blood Gas Analyser	150(100)
Pulse Oxymeter	25
Radiant Warmer	50
Phototherapy Unit	50
Monitor	50
Bilirubinometer	20
Ventilator	200
Endoscope	200
Cuttry	50
Pulse Oxymeter (O.T.)	50
Chest tube	50
Blood Sugar (Glucometer)	30
ICU (per day)	200(150)
Newborn Unit (Admission)	50
Cabine (per day)	150(100)
Infusion Pump	25
Syringe Pump	25
<u>AMBULANCE</u>	
One person (inside city)	75
More than one person	30
For outside per k.m.	3

()内金額は2004年6月以前の金額

8-4 ICUにおける無料病床設置の検証

1) ICUにおける有料病床数、無料病床数の算定

付属資料 - 1「ICU 病床数の算定法」で算定された ICU の病床数は NICU : 9 床、PICU : 12 床であるが、それらは計画必要数であり、有料病床と無料病床が合計された病床数である。オリッサ州では、州政府が発行する貧困者カード保有者が人口の 47%といわれているので、上記 ICU 病床数の有料病床数と無料病床数は計算上、以下のように考えられる。

NICU	有料病床数	9 床 × 53%	=	4.77 床
	無料病床数	9 床 × 47%	=	4.23 床
PICU	有料病床数	12 床 × 53%	=	6.36 床
	無料病床数	12 床 × 47%	=	5.64 床

2) 無料病床数の検証

NICU 及び PICU において、有料病床からの受益者負担費収入で無料病床を含めた各 ICU の運営費用が賄えれば、ICU の運営については病院の適正運営に支障をきたさないといえる。このことから、上記の 1) で算定された有料病床数、無料病床数を基に、ICU における無料病床設定を検証する。

a) NICU

A: 運営費用 (年間)

人件費	看護婦長	= 6,000Rs/日 × 12 ヶ月 × 9/(9+12) =	30,857Rs/年
	(看護婦長は NICU と PICU で共用する)		
	看護婦	= 4,000Rs/日 × 12 ヶ月 × 8	= 389,000Rs/年
	看護婦補助員	= 2,000Rs/日 × 12 ヶ月 × 8	= 192,000Rs/年
	機材年間保守管理契約費 (AMC)	別表より	= 235,803Rs/年
	A の合計		847,660Rs/年

B: 受益者負担費収入 (年間)

機材使用料	別表より	= 591,959Rs/年
入院費	4.77 床 × 200Rs/床 × 365 日/年	= 348,210Rs/年
	B の合計	940,169Rs/年

以上より B > A であり、有料病床の受益者負担費収入で無料病床を含めた NICU : 9 床の運営に支障をきたさないことが検証される。

b) PICU

A: 運営費用 (年間)

人件費	看護婦長	= 6,000Rs/日 × 12 ヶ月 × 12/(9+12) =	41,143Rs/年
	看護婦	= 4,000Rs/日 × 12 ヶ月 × 8	= 389,000Rs/年
	看護婦補助員	= 2,000Rs/日 × 12 ヶ月 × 8	= 192,000Rs/年
	機材年間保守管理契約費 (AMC)	別表より	= 266,057Rs/年
	A の合計		888,200Rs/年

B: 受益者負担費収入 (年間)

機材使用料	別表より	= 567,868Rs/年
入院費	6.36 床 × 200Rs/床 × 365 日/年	= 464,280Rs/年
	B の合計	1,041,148Rs/年

以上より B > A であり、有料病床の受益者負担費収入で無料病床を含めた PICU : 12 床の運営に支障をきたさないことが検証される。

ICU 機材年間保守管理契約費（AMC）推計表

ICU	機材名	設置台数	AMC 単価	AMC 価格	
NICU	吸引器	9	Rs. 340	Rs. 3,060	
	輸液ポンプ	9	1,060	9,540	
	シュリンジポンプ	6	840	5,040	
	低圧持続吸引器	2	360	720	
	患者監視装置	9	9,000	81,000	
	人工呼吸器	2	25,000	50,000	
	ウォーマー付新生児処置台	9	2,500	22,500	
	光線治療器	7	2,000	14,000	
	超音波ネブライザー	1	1,800	1,800	
	血液ガス分析装置	1	75,000 × 9/21	32,143	
	(PICU と共用)				
	ビリルビンメーター	1	16,000	16,000	
合計				235,803	
PICU	吸引器	12	Rs. 340	Rs. 4,080	
	輸液ポンプ	12	1,060	12,720	
	シュリンジポンプ	7	840	5,880	
	低圧持続吸引器	2	360	720	
	患者監視装置	12	9,000	108,000	
	人工呼吸器	3	25,000	75,000	
	除細動器	1	10,000	10,000	
	ウォーマー付新生児処置台	2	2,500	5,000	
	超音波ネブライザー	1	1,800	1,800	
	血液ガス分析装置	1	75,000 × 12/21	42,857	
	(NICU と共用)				
	合計				266,057

ICU 機材受益者負担費収入（年間）

ICU	機材名	使用単価 (Rs/日)	有料病床数	利用率 回/日人	年間使用料
NICU	輸液ポンプ	25	4.77 人	1	Rs. 43,526
	シュリンジポンプ	25	4.77	0.6	26,116
	患者監視装置	50	4.77	1	84,053
	人工呼吸器	200	4.77	0.3	104,463
	ウォーマー付新生児処置台	50	4.77	1	87,053
	光線治療器	50	4.77	0.8	69,642
	血液ガス分析装置	150	4.77	0.6	156,695
	ビリルビンメーター	20	4.77	0.5	17,411
合計					591,959
PICU	輸液ポンプ	25	6.36	1	Rs. 58,035
	シュリンジポンプ	25	6.36	0.6	34,821
	患者監視装置	50	6.36	1	116,070
	人工呼吸器	200	6.36	0.3	139,284
	ウォーマー付新生児処置台	50	6.36	0.17	19,732
	血液ガス分析装置	150	6.36	0.6	208,926
合計					576,868

インド国

SVP 小児医療教育病院整備計画

ソフトコンポーネント計画書

2004年10月

株式会社 横河建築設計事務所
株式会社 第一医療施設コンサルタンツ 共同企業体

目 次

1 . ソフトコンポーネントを計画する背景	1
2 . ソフトコンポーネントの目標	2
3 . ソフトコンポーネントの成果	3
4 . 成果達成度の確認方法	3
5 . ソフトコンポーネントの活動（投入計画）	4
6 . ソフトコンポーネントの実施リソースの調達方法	5
7 . ソフトコンポーネントの実施工程	5
8 . ソフトコンポーネントの成果品	6
9 . ソフトコンポーネントの概算事業費（和文のみ）	6
10 . 相手国実施機関の責務	7

1. ソフトコンポーネントを計画する背景

1 - 1 . 本病院の現在の機材運用・維持管理体制

本病院では、副院長のもと中央倉庫担当者 2 名が機材の台帳及び修理状況等を記帳しているのみであり、機材の運用・維持管理を担当する部門も無く、専門技術者も配置されていない。日常の運用・維持管理については全て機材使用部門の看護師が担当している。さらに、使用部門からの機材故障、修理要請依頼等の報告システム等が整備されていないため報告・要請が遅延するなどして機材が不稼働となる期間が発生しているだけでなく、使用されず放置されている機材も出現している。また、機材の維持・管理分担が明確に規定されていないため、日常の維持管理が適切に実施されていないために、故障及び交換部品・消耗品等の不足により使用されず放置されている機材も出現している。保有機材の現状が把握できていないとともに、保有機材が有効活用されているとはいえない状況にある。

1 - 2 . 本病院の機材運用・維持管理体制整備計画

病院側も現在の機材の運用・維持管理体制が不備であることを認識しており、受益者協会の収入により最近調達された機材の一部についてはメーカー/代理店と年間保守契約(AMC 契約：Annual Maintenance Contract)を締結し機材の保守に努めるとともに、運用・維持管理体制を整備、確立することを計画している。具体的には、副院長直属に機材の管理のための技術者もしくは技能者を受益者協会の収入により雇用し機材の運用・維持管理システムを構築するとともに、維持管理が難しい機材については全てメーカー/代理店と AMC 契約を締結し定期点検を受けることにより機材の不稼働期間の発生を防止するとともに、機材を一元管理して有効活用を図る計画を策定している。

1 - 3 . ソフトコンポーネント支援の必要性

調達機材をはじめとし保有機材の不稼働を排除し有効活用を図るには、機材の運用・維持管理システムが構築される必要がある。同システムは機材管理番号の設定、機材台帳及び付随する部品、消耗品在庫台帳等の改定・整備、使用部門からの報告フォーム等の整備などで構築される。

また、機材の維持管理は、使用者が実施する維持管理と専門技術者による故障時の修理や定期点検がある。現状では使用者による機材の使用前後の点検及び清掃等がシステム化されていないとともに、専門技術者が配置されていないため故障時の修理は全て故障発生の度にメーカー/代理店へ依頼しているがこれもシステム化されていない。さらに、機材の定期点検については、一部機材については AMC 契約によりメーカー/代理店の定期点検があるもののこれを管理するシステムも整備されていない。専門技術者が配置されることにより点検システムの構築が図れる。

病院側が上記 1 - 2 の機材運用・維持管理体制整備を計画していることを踏まえて、同計画をさらに効果的に確立するために、機材運用・維持管理体制構築をソフトコンポーネントにて支援する。

2. ソフトコンポーネントの目標

2-1. ソフトコンポーネントの目標

本病院が計画している機材運用・維持管理体制構築を支援し、機材の運用・維持管理体制能力の向上を図る。

2-2. ソフトコンポーネント支援の具体的目標

(1) 機材及び部品等の一元管理化、並びに維持管理・履歴管理支援

機材台帳や部品・消耗品台帳等の整備、機材の保守・管理マニュアル類の整備を支援するとともに、各機材の修理・保守履歴を記録することにより、維持管理、故障予測、適切な在庫管理等を図るためのシステムの構築を支援することで運用・維持管理の技術移転を行う。

(2) 機材の運用・維持管理体制づくり支援

現状では機材の運用・維持管理体制が確立していないので、同体制づくりを支援する。

(3) 予防的維持管理支援

予防的維持管理の実行は、故障等による機材の不稼働期間発生を防止するとともに、維持管理経費の軽減に資するだけでなく、安全性の確保という機材の基本的問題にも直結している。

予防的維持管理には、機材の使用者が行うものと機材の専門技術者が行うものがある。機材の使用者が行う予防的維持管理は、機材の清掃から始まり簡単な始業・終業点検等であるが、確実に実施されることにより重大な故障の防止効果は非常に高い。一方、機材の専門技術者が行うべき予防的維持管理は、定期点検等を実施することにより機材の状態を把握し、使用者への注意や部品の交換時期を把握するなどして、機材の稼働能力を常に保っていくことを目的としている。機材毎に専門知識が必要な機材は全て、メーカー/代理店とAMC契約を締結してこれらの専門技術者により定期点検等を実施することが適切である。

機材の使用者が行う予防的維持管理である機材の清掃から始まり簡単な始業・終業点検等のシステム化、メーカー/代理店とのAMC契約の管理のシステム化を支援する。

(4) 機材の故障を始めとする不具合発生時の解決システム構築支援

機材の故障を始めとする不具合が発生した場合には、早急にメーカー/代理店に連絡し、これらを解決しなければならない。機材故障、修理要請依頼の報告システム等の構築を支援する。

調達機材については、使用者による誤使用の防止や日常点検等による初期トラブル防止、機材及び部品等の適切な管理方法の整備・マニュアル化並びに予防的維持管理の技術移転を実施する。

現在の維持管理体制は、故障が発生した際に修理を行う初歩的維持管理だけの状況にあるため、総合的な体制構築の技術指導を実施する。

3. ソフトコンポーネントの成果

ソフトコンポーネントを実施した場合、以下の成果が期待できる。

- (1) 機材及び部品等の一元管理化並びに維持管理履歴システムの構築により、機材台帳などが整備される。
- (2) 機材の運用・維持管理体制が明確に規定されることにより、機材維持管理に対する責任体制が強化される。
- (3) 予防的維持管理システムの構築により、故障・不稼働が軽減する。
- (4) 機材の故障を始めとする不具合等発生時の解決システムが構築されることにより、機材の修理が迅速に行われる。

このような成果を通し、機材の運用・維持管理能力が向上することで、維持管理費用の軽減、機材の安全性確保並びに調達機材の長期にわたる使用、効率的且つ効果的な使用が可能となることから、協力成果の持続性の確保及び協力成果のさらなる向上等が期待できる。

4. 成果達成度の確認方法

ソフトコンポーネントの成果を確認する方法は次のとおりである。

項目	成果	成果達成度の確認方法
機材及び部品等の一元管理化、並びに維持管理履歴管理システムが構築される。	<ul style="list-style-type: none"> 1.機材台帳や部品・消耗品台帳等が整備される。 2.機材の保守・管理マニュアル類が整備される。 3.各機材の修理・保守履歴が整備される。 	1～3については台帳、マニュアル管理台帳、各機材の修理・保守履歴フォームの策定、及び使用状況等のモニタリング。
機材の運用・維持管理体制が明確に規定される。	<ul style="list-style-type: none"> 1.機材の運用・維持管理に対する責任体制が強化される。 	1.組織規定等の明文化及び活動状況のモニタリング。
予防的維持管理システムが構築される。	<ul style="list-style-type: none"> 1.各機材の日常点検マニュアルが整備される。 2. 日常点検マニュアルに基づき日常点検が実施される。 3.各機材の AMC 契約管理台帳が整備されるとともに、AMC 契約に基づく定期点検等が実施される。また、定期点検等により指摘された事項等についてその後のフォローアップ等が実施される。 	<ul style="list-style-type: none"> 1.日常点検マニュアルの策定。 2.日常点検記録フォームが策定される、また、これに点検結果等が記録されているか、また、不具合等が発生した場合には機材故障、修理要請依頼等の報告システムに基づき遅滞なく運用・維持管理責任者に報告されているかのモニタリング。 3.各機材の AMC 契約管理台帳の策定。AMC 契約による定期点検結果報告書等が保管されているかのモニタリング。定期点検等により指摘された事項等についての的確に処理されているかのモニタリング。

機材の故障を始めとする不具合等発生時の解決システムが構築される。	1.機材故障等不具合発生報告書フォーム及び修理要請フォーム等が整備される。 2.同上フォームが使用され遅滞なく不具合修正、故障修理等が実施される。	1 機材故障等不具合発生報告書フォーム及び修理要請フォーム等の策定。 2.同上フォームが使用され遅滞なく不具合修正、故障修理等が実施されているかのモニタリング。
----------------------------------	--	---

5 . ソフトコンポーネントの活動（投入計画）

ソフトコンポーネントの活動（投入計画）は次のとおりである。

ソフトコンポーネントは日本人の機材運用・維持管理専門家 1 名が本病院に常駐し、副院長直属として新規に雇用される機材の管理のための技術者もしくは技能者を直接のカウンターパートとして実施する。ソフトコンポーネント実施期間は機材引渡し前後 6 週間を予定する。

項目	活動内容	成果品
機材及び部品等の一元管理化、並びに維持管理履歴管理システムの構築支援	1.各機材に個別の管理番号を設定し、パソコンによる機材管理台帳の策定をカウンターパートと共に行う。(台帳には機材の修理・保守履歴も含める) 2.パソコンによる機材毎の部品・消耗品台帳策定を支援するとともに在庫管理方法の指導をカウンターパートを始めとし、機材使用者を集めたワークショップを開催して実施する。 3.各機材のマニュアル整備及びマニュアル管理台帳の策定をカウンターパートと共に行う。	1.機材管理台帳 2.部品・消耗品台帳 3.マニュアル管理台帳
機材の運用・維持管理体制づくり支援	1.機材の運用・維持管理組織の体制づくりを病院幹部と行う。	1.機材の運用・維持管理規程
予防的維持管理システムの構築支援	1.各機材の日常点検マニュアル及び日常点検記録フォームの策定をカウンターパートと共に行う。 2.各機材の AMC 契約管理台帳策定をカウンターパートと共に行う。(台帳には定期点検等により指摘された事項等についてその後のフォローアップ等の記録が含まれるようにする。).	1.各機材の日常点検マニュアル及び日常点検記録フォーム 2.各機材の AMC 契約管理台帳
機材の故障を始めとする不具合等発生の際の解決システムの構築支援	1.機材故障等不具合発生報告書フォーム及び修理要請フォーム等の策定をカウンターパートと共に行う。 2.各機材のメーカー/代理店台帳策定をカウンターパートと共に行う。	1.機材故障等不具合発生報告書フォーム及び修理要請フォーム 2.各機材のメーカー/代理店台帳

6. ソフトコンポーネントの実施リソースの調達方法

オリッサ州政府は各病院の保守・維持管理体制には問題があるとして、英国 DFID の支援を受けた「保健政策マネージメント強化支援事業」において現状を分析し、これに基づく改善・強化計画を 2003 年 2 月に策定した州の保健開発計画である「オリッサ・ビジョン 2010」に盛り込こんでいる。この改善・強化計画は機材部門と施設・設備部門の 2 部門に分けて策定されているが、その実施状況を現地調査の際に調査したところ、州の保健家族福祉部の担当部門も確定していない状況にあり、何の進捗もないことが判明した。これは、インド国内ではこの種の機材の運用・維持管理に係るノウハウ及び専門家が不足していることに起因していると考えられる。

また、病院の機材保守管理を目的として設立され、英国 DFID のプロジェクトにおいて現状分析を担当するとともに現在は世銀支援による「オリッサ州保健システム開発プロジェクト」において州政府の機材調達代理人として活動している州の公社である ELMARC 社を訪問調査したところ、同公社は電気機器開発公社より分離したものであり、機材のハード面の保守管理が重点となっており、ソフト面についてはノウハウ、人材等が乏しいことが確認された。

これより、ソフトコンポーネントは日本人専門家により実施されるのが最善と判断される。

7. ソフトコンポーネントの実施工程

調達機材が引き渡される時期と相前後して業務を開始する。投入期間は 6 週間を計画し、そのスケジュールは次のとおりである。

活動内容	週	1	2	3	4	5	6
機材及び部品等の一元管理化、並びに維持管理履歴管理システムの構築支援							
機材及び部品等管理台帳策定							
各機材の保守・管理マニュアル類の整備及びマニュアル管理台帳策定							
機材の運用・維持管理体制作り支援							
予防的維持管理システムの構築支援							
各機材の日常点検マニュアル策定							
各機材の AMC 契約管理台帳策定							
機材の故障を始めとする不具合等発生の際の解決システムの構築							
機材故障等不具合発生報告書フォーム及び修理要請フォーム等の策定							
各機材のメーカー / 代理店台帳策定							
その他							
実施状況モニタリング							
モニタリング結果の分析・提言							

8. ソフトコンポーネントの成果品

施主及び日本側への完了報告書その他、ソフトコンポーネントの成果品として次を予定する。

機材及び部品等管理台帳

マニュアル管理台帳

各機材の日常点検マニュアル及び日常点検記録フォーム

AMC 契約管理台帳

機材故障等不具合発生報告書フォーム及び修理要請フォーム

各機材のメーカー / 代理店台帳

モニタリング結果報告書

9. ソフトコンポーネントの概算事業費

ソフトコンポーネントの概算事業費は次のとおり 4,159,000 円と積算される。

直接人件費

担当業務	月額(円)	従事人月			横計(円)
		現地	国内	計	
機材運用・維持管理	846,000	1.53		1.53	1,294,380
合計					1,294,380 千円未満切捨 <u>1,294,000</u>

直接経費

1) 旅費・日当・宿泊費

担当業務	等級	現地日数	宿泊費(円)	日当(円)	航空運賃(円)	計(円)
機材運用・維持管理	3	46日	30泊 x11,600=348,000 14泊 x11,600x90% =146,160	30日 x3,800=114,000 16日 x11,600x90% =54,720	1回 x464,200 =464,200	宿泊+日当 +航空運賃=
合計			494,160	168,720	464,200	1,127,080

航空運賃:東京 ニューデリー プバネシュワール往復 = 464,200 円

2) 日本国内旅費

東京 成田 1回 x 4,140 円 = 4,140 円 4,140 円

3) 車輦費

1台 x 42日 x 6/7 x Rs.900 x @2.43 円 = 78,732 円 78,732 円

直接経費合計 1,209,952 円

(千円未満切捨) 1,209,000 円

間接費

1) 諸経費:直接人件費 x90%		
1,294,380 円 × 90% = 1,164,942 円		1,164,942 円
2) 技術経費:(直接人件費 + 諸経費) x20%		
(1,294,380 円+1,164,942 円) × 20% = 491,864 円		491,864 円
	間接費合計	1,656,806 円
	(千円未満切捨)	<u>1,656,000 円</u>
	ソフトコンポーネント費合計	4,159,000 円

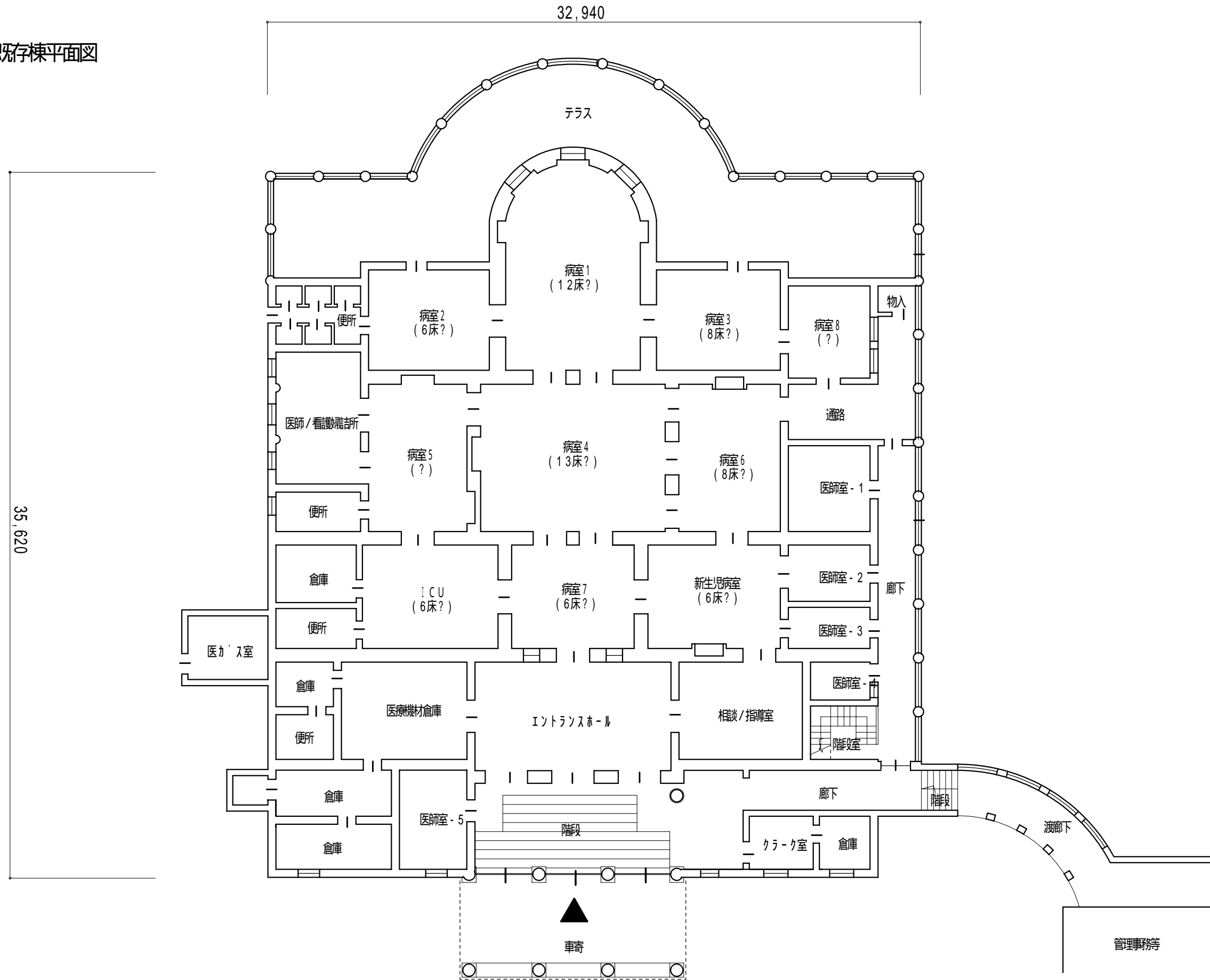
10 . 相手国実施機関の責務

ソフトコンポーネント支援により機材の運用・維持管理体制が整備されることとなるが、機材の AMC 契約費用、修理費用、部品及び消耗品購入費用等の資金手当てがなされなければ効果は持続していかない。それら費用を受益者協会の収入により継続的に確保すること。

また、日本側による供与機材の引渡し以前に機材維持管理の技術者を雇用すること。

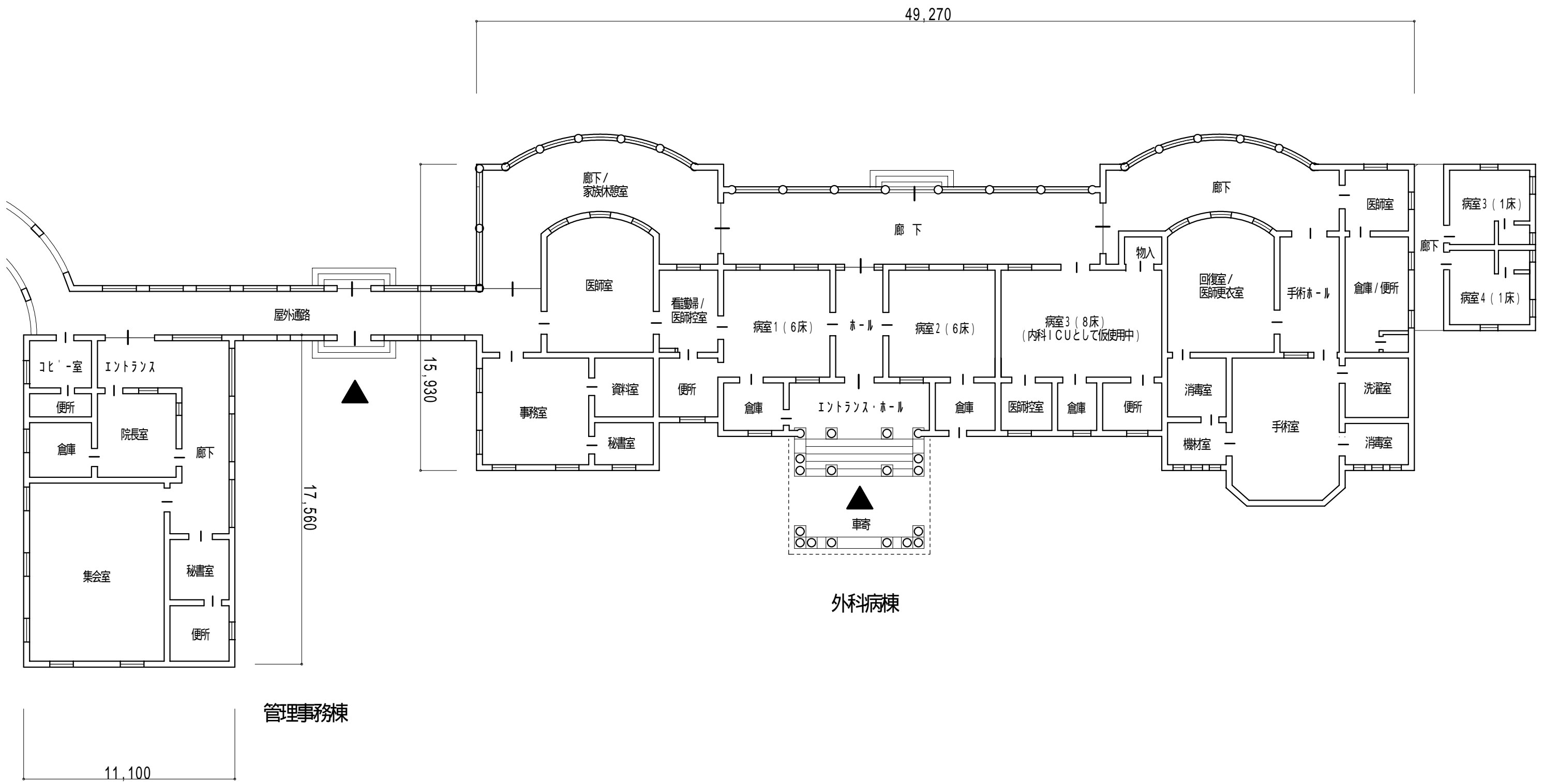
日本側協力対象事業の完了後には、機材の運用・維持管理組織体制の強化に引き続き努めるとともに、定期的に院内でワークショップを開催し、機材の使用者の意識を高めること。

8 - 6 既存棟平面図

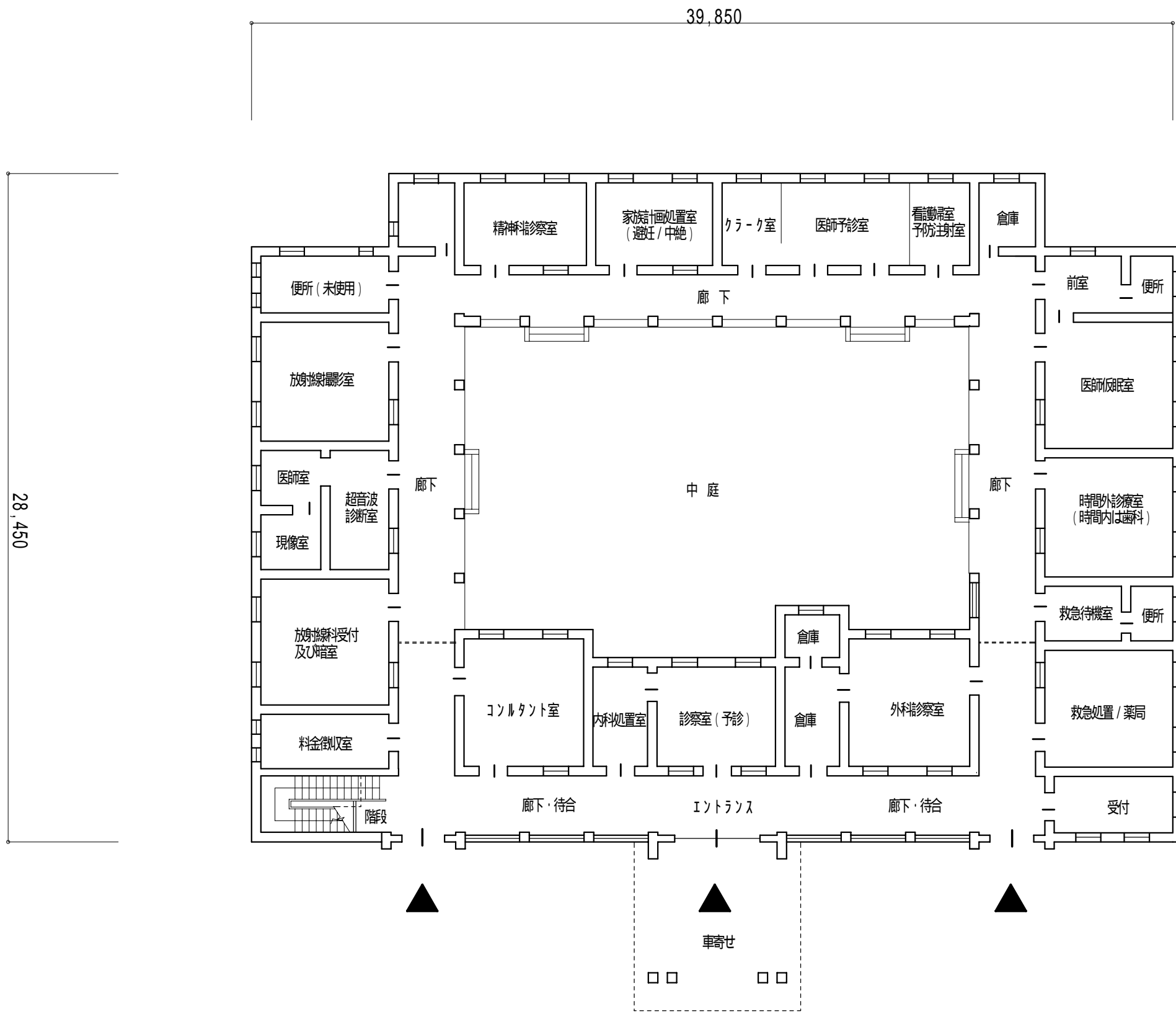


平面図 縮尺: 1/200

特記: 病床数は現在改修工事中の為不明
図面中の記入病床数は、予備調査時の病床数を記入



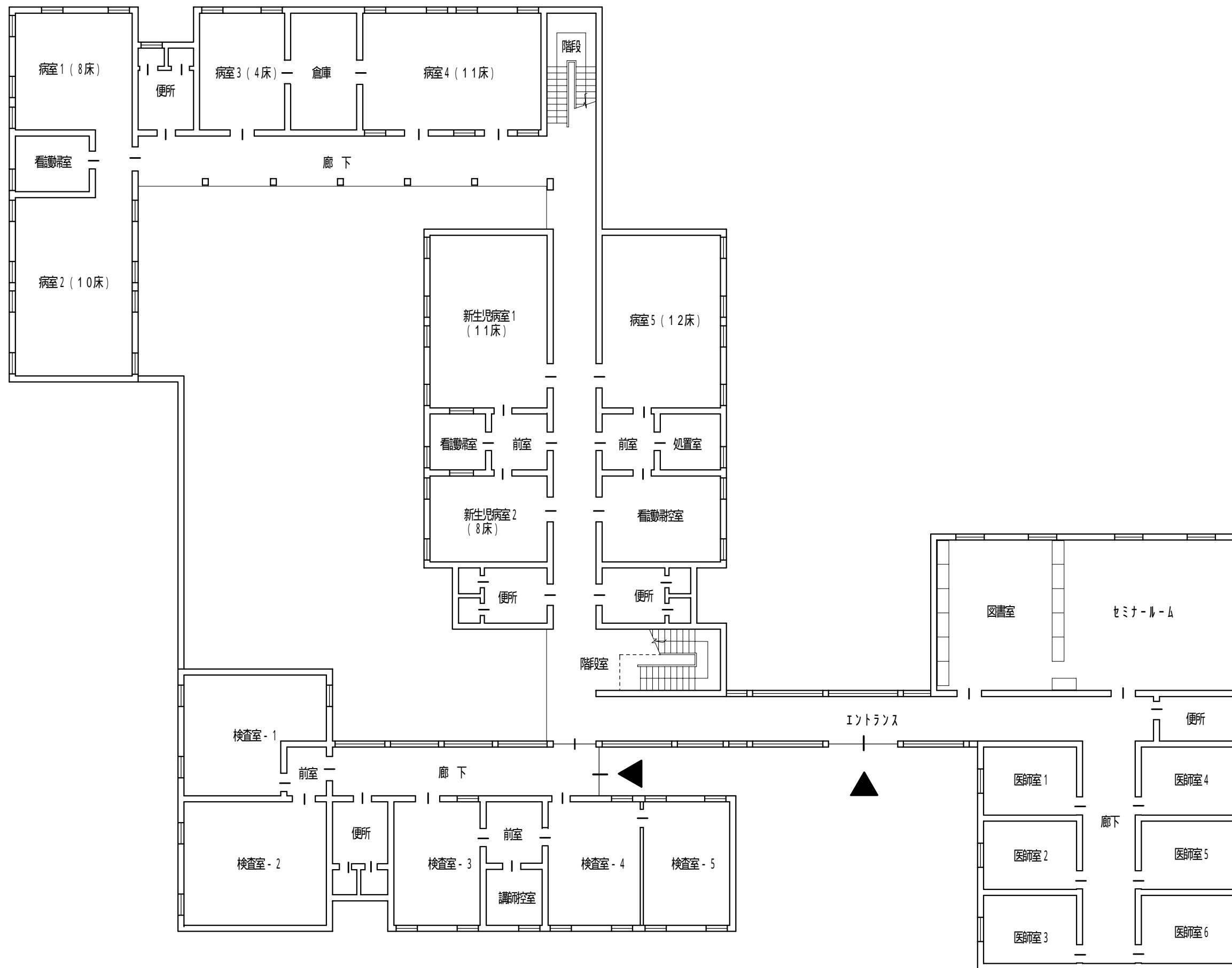
平面図 縮尺: 1/200



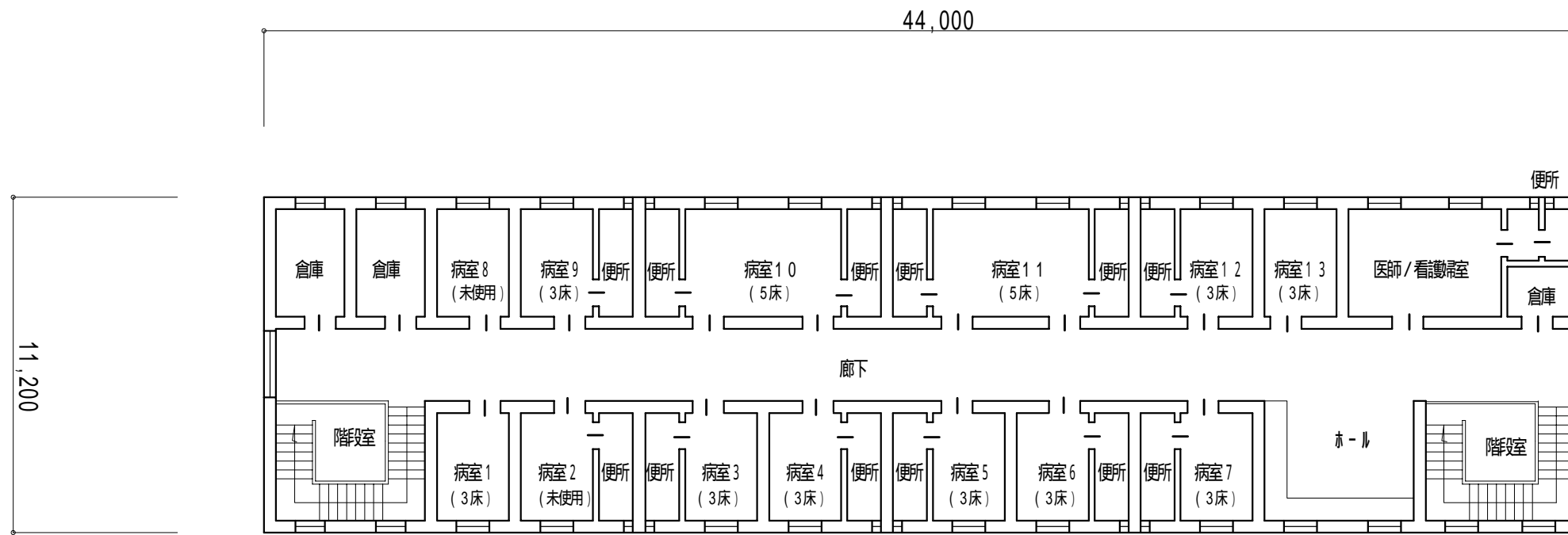
平面図 縮尺: 1/200

60,950

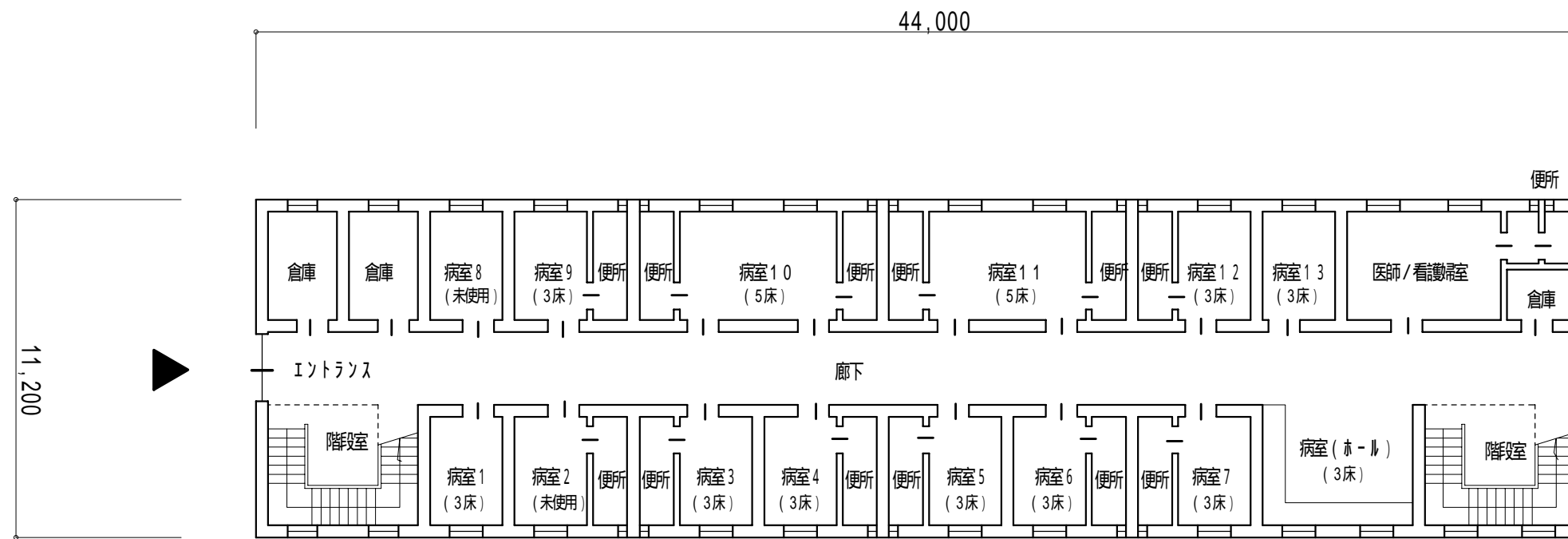
45,550



1階平面図 縮尺: 1/200



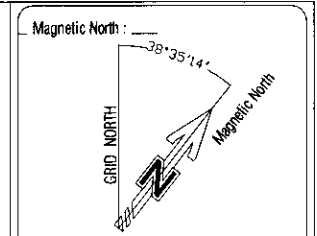
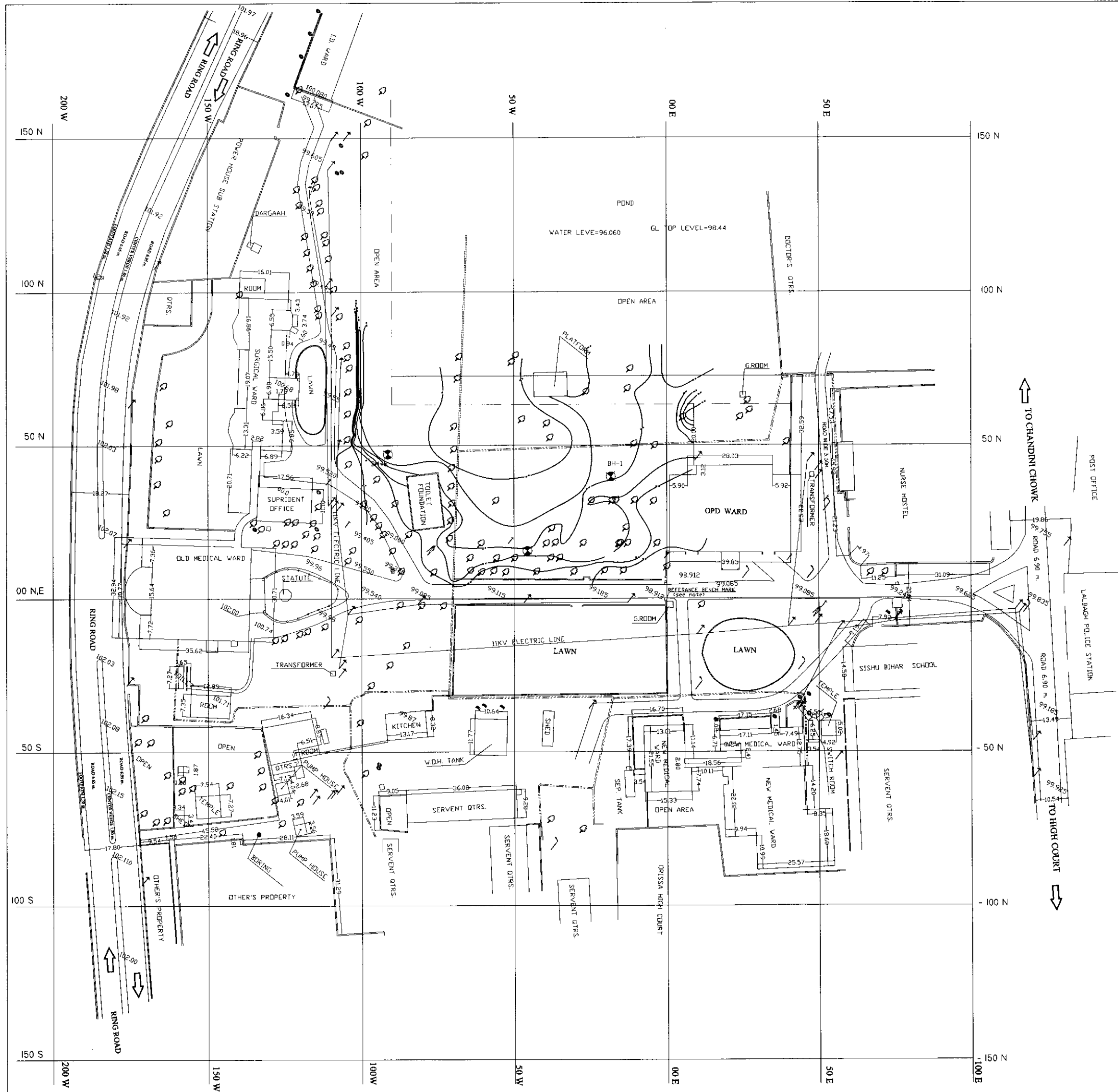
2階平面図 縮尺：1/200 (現在2階のみ感染定病棟として使用中)



1階平面図 縮尺：1/200 (現在内科病棟として仮使用中)

8-7 自然条件調査

8-7-1 敷地測量図



- Notes :
01. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED
 02. DO NOT SCALE THE DRAWING, IF IN DOUBT PLEASE ASK
 03. GRIDS ARE DRAWN AT 10 & 10 0m INTERVAL
 04. CONTOUR INTERVAL IS 0.20M
 05. REF. B.M. MARKS TAKEN ON GATE-PILLAR (IN 60 60000 50 000) AS 100.00 M. WHICH IS 0.90 M. ABOVE GROUND LEVEL AS 0-DIM IN PLAN

- Legends :
- LETTER BOX
 - TREE
 - ELECTRIC POLE
 - LIGHT POLE
 - ROAD
 - STRUCTURE
 - MAN HOLE
 - BOUNDARY WALL
 - SLOVE VALVE
 - HAND PUMP
 - BORE HOLE
 - BORING
 - TELEPHONE
 - DRAIN

Area Details :

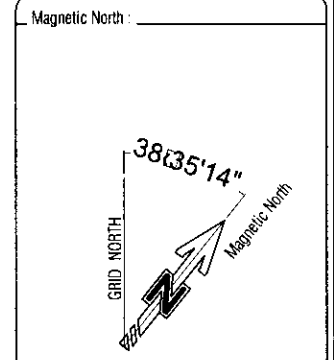
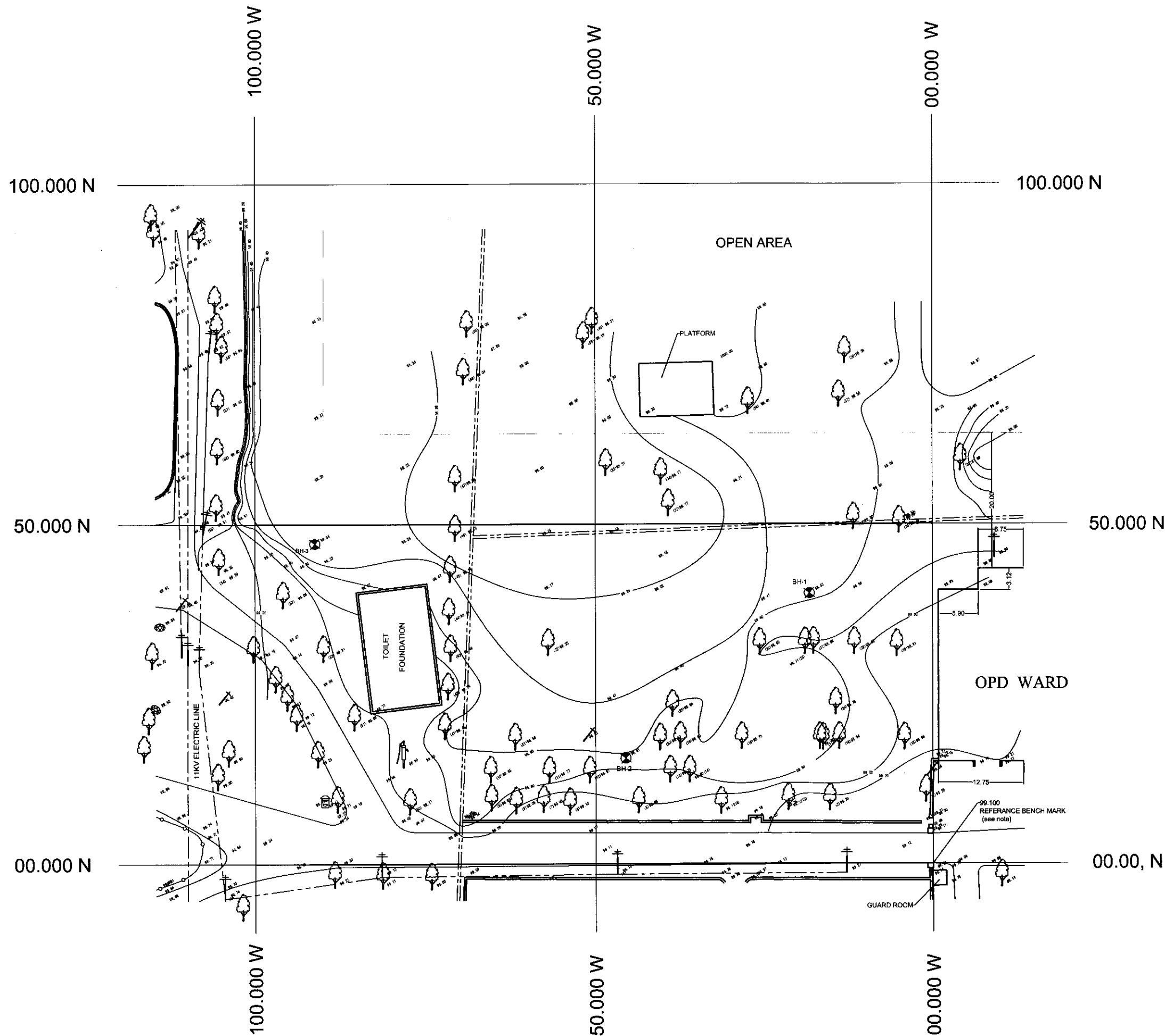
S.NO.	LEVEL
BH-1.	98.527
BH-2.	98.585
BH-3.	98.337

Project : Topographical Survey Plan of
**S.V.P. POST GRADUATE INSTITUTE OF PAEDIATRICS
 CUTTACK, ORISSA**

Client : THE CONSORTIUM OF
 YONGARA ARCHITECTS & ENGINEERS, INC. AND
 DARGOH HEALTH CARE FACILITY CONSULTANTS INC.
 TOKYO, JAPAN.

Surveyed by : **CENGRS GEOTECHNICA Pvt. Ltd.**
 Civil & Geotechnical Engineers, B-3/87 Sakinagar Enclave, New Delhi - 28.
 Tel. 011 (2610 3774, 2610 5251.) Fax: 011 - 2619 3960

Scale : 1:500	Site: Final Stage	Date: Dec. 04	Area: 1.50	Sheet: 1/10
Date: MAY 2004	Job No: 261026-A	Drawn: 00		



- Notes:
01. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED
 02. DO NOT SCALE THE DRAWING, IF IN DOUBT PLEASE ASK
 03. GRIDS ARE DRAWN AT 10.0 x 10.0m INTERVAL
 04. REF. BM MARKED TAKEN ON GATE PILLER (N. 00.000E 00.000) AS 100.00m WHICH IS 0.90m ABOVE GROUND LEVEL AS SHOWN IN PLAN.

Legends:

LETTER BOX	
TREE	
ELECTRIC POLE	
LIGHT POLE	
ROAD	
STRUCTURE	
MAN HOLE	
BOUNDARY WALL	
SLOPE VALVE	
HAND PUMP	
BORE HOLE	
BORING	
TELEPHONE	
DRAIN	

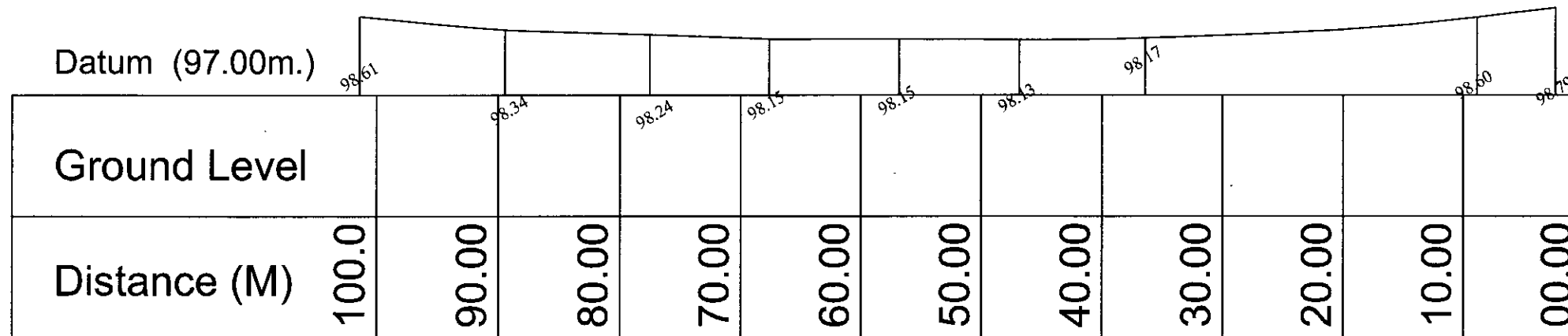
S.NO.	LEVEL
BH-1	98.527
BH-2	98.585
BH-3	98.337

Project: Topographic Survey Plan of
**S.V.P. POST GRADUATE INSTITUTE OF PAEDIARICS
 CUTTACK, ORISSA**

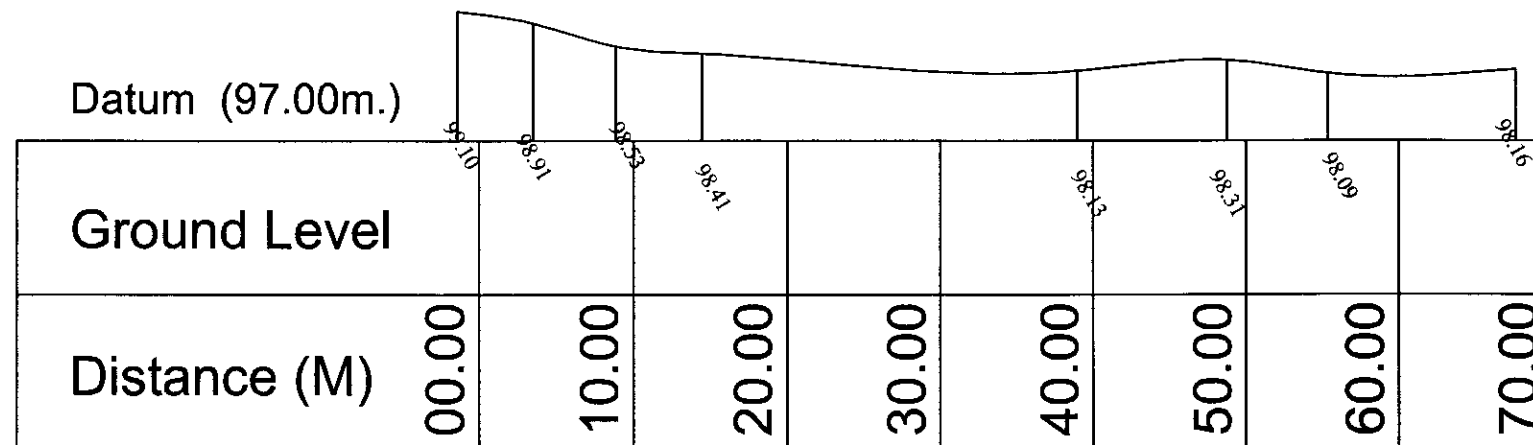
Client: THE CONSORTIUM OF
 YOKOGAWA ARCHITECTS & ENGINEERS INC. AND
 DANICI HEALTH CARE FACILITY CONSULTANTS INC.
 TOKYO, JAPAN

Surveyed by: **CENGRS GEOTECHNICA Pvt. Ltd.**
 Civil & Geotechnical Engineers, B-3/87 Sakurung Enclave, New Delhi - 28
 TEL: 011 (2610 3774, 2610 525) FAX: 011 2619 3985

Scale: 1:200	Site: Pradanga	Dr: Anant	Chk: S. Jatin
Date: MAY, 2004	Job No: 264550-A	Rev: 00	



L - Section 50-N, 50-N



L - Section 50-W, 50-W

Project Topographical Survey Plan of S.V.P POST GRADUATE INSTITUTE OF PAEDIATRICS CUTTACK, ORISSA			
Client THE CONSORTIUM OF YOKOGAWA ARCHITECTS & ENGINEERS, INC. AND DAICHI HEALTH CARE FACILITY CONSULTANTS INC. TOKYO, JAPAN			
Surveyed By CENGRS GEOTECHNICA Pvt. Ltd. Civil & Geotechnical Engineers, B-3/87 Sarajong Enclave, New Delhi - 28. TEL: 011 (2610 3774, 2610 525...) FAX: 011 - 2619 3985			
Scale	Site	Drawn	Checked
1:200	Prasoon	Amc	r. jain
Date	Job No.	Rev. No.	
MAY, 2004	204050-A	00	



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204050-B

Sheet No. i

REPORT ON :
GEOTECHNICAL INVESTIGATION AT
S.V.P. POST GRADUATE INSTITUTE
OF PEDIATRICS AT CUTTACK
(ORISSA)

Submitted to:

The Consortium of
Yokogawa Architects Engineers, Inc. and
Daiichi Health Care Facility Consultants Inc.
2-20-28, Shimomeguro, Meguro-Ku
Tokyo, Japan



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204050-B

Sheet No. ii

TABLE OF CONTENTS

	<u>Sheet No.</u>
1.0 INTRODUCTION	1
1.1 Project Description	1
1.2 Purposes of Study	1
2.0 FIELD INVESTIGATIONS	1
2.1 Soil Borings	1
2.2 Groundwater	2
3.0 LABORATORY TESTS	2
4.0 GENERAL SITE CONDITIONS	3
4.1 Site Stratigraphy	3
4.2 Groundwater	4
5.0 CONCEPTS FOR ANALYSIS	4
5.1 Bearing Capacity for Shallow Foundations	4
5.2 Settlement Analysis for Shallow Foundations	5
5.3 Axial Capacity of Bored Piles	6
6.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS	7
6.1 General	7
6.2 Foundation Type and Depth	7
6.3 Shallow Foundations	8
6.4 Pile Foundations	10
6.5 Definition of Gross and Net Bearing Pressure	11
6.6 Liquefaction Potential	12
7.0 FOUNDATION CONSTRUCTION CONSIDERATIONS	12
7.1 Excavation	12
7.2 Foundation Level Preparation	12
7.3 Pile Construction	13
7.4 Pile Load Tests	13
7.5 Chemical Attack	13
7.6 Variability in Subsurface Conditions	14
8.0 SUMMARY OF PRINCIPAL FINDINGS AND RECOMMENDATIONS	14
9.0 CLOSURE	15



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204050-B

Sheet No. iii

TABLES

	<u>Table No.</u>
Soil Profiles	1 to 3
Engineering Description of Soils	4
Chemical Test Results	5

ILLUSTRATIONS

	<u>Fig. No.</u>
Plan of Field Investigation	1
Summary of Borehole Profile	2
Standard Penetration Test Results	3
Grain Size Analysis	4 to 12
Shear Test Results	13 to 21
Consolidation Test Results	22 to 24
Typical Calculations	



1.0 INTRODUCTION

1.1 Project Description

Sardar Vallabh Patel Post Graduate Institute of Pediatrics at Cuttack, Orissa is planning to expand its facilities. A two storey building is planned with covering an area to about 5000 m². The average ground level is taken as 98.5 m.

M/s. Yokogawa Architects & Engineers, Inc. and Daiichi Health Care Facility Consultants Inc., Tokyo, Japan is the project consultant for this project. A layout plan showing the locations of our field investigation is illustrated in Fig. 1.

1.2 Purposes of Study

The overall purposes of this study are to investigate the stratigraphy at the site and to develop geotechnical recommendations for foundation design and construction. To accomplish these purposes, the study was conducted in the following phases:

- (a) drilling three boreholes to 30 m depth or refusal, whichever is earlier in order to determine site stratigraphy and to collect soil samples for laboratory testing;
- (b) testing selected soil samples in the laboratory to determine pertinent index and engineering properties of the soils ; and
- (c) analyzing all field and laboratory data in order to develop engineering recommendations for foundation design and construction.

2.0 FIELD INVESTIGATIONS

2.1 Soil Borings

The borings were progressed using a shell and auger to the specified depth or refusal, whichever is encountered earlier. The diameter of borehole was 150 mm. Where caving of the borehole occurred, casing was used to keep the borehole stable. The work was in general accordance with IS:1892-1979.



Standard Penetration Tests (SPT) were conducted in the boreholes at 1.5 m depth intervals by connecting a split spoon sampler to 'A' rods and driving it by 45 cm using a 63.5 kg hammer falling freely from a height of 75 cm. The tests were conducted in accordance with IS:2131-1981.

The number of blows for each 15 cm of penetration of the split spoon sampler was recorded. The blows required to penetrate the initial 15 cm of the split spoon for seating the sampler is ignored due to the possible presence of loose materials or cuttings from the drilling operation. The cumulative number of blows required to penetrate the balance 30 cm of the 45 cm sampling interval is termed the SPT value or the 'N' value.

The 'N' values are presented on the soil profile for each borehole. Refusal to further boring penetration was considered when the 'N' values exceed 100 or when practical refusal to further penetration by shell and auger was encountered.

Disturbed samples were collected from the split spoon after conducting SPT. The samples were preserved in transparent polythene bags. Undisturbed samples were collected by attaching 100 mm diameter thin walled 'Shelby' tubes and driving the sampler using a 63.5 kg hammer in accordance with IS: 2132-1986. The tubes were sealed with wax at both ends. All samples were transported to our Delhi laboratory for further examination and testing.

2.2 Groundwater

Groundwater level was measured in the boreholes 24 hours after drilling and sampling was completed. The measured water levels are recorded on the individual soil profiles.

3.0 LABORATORY TESTS

The laboratory testing programme was aimed at verifying the field classifications and developing parameters for engineering analysis. All tests were performed in accordance with the current applicable IS specifications. The following tests were conducted on selected soil and water samples recovered from the borehole:



Laboratory Test	Applicable IS: Code
Natural moisture content	IS: 2720 (Part-2)-1973
Grain size analysis	IS: 2720 (Part-4)-1985
Liquid, Plastic limit and shrinkage limit	IS: 2720 (Part-5& 6)-1985
Specific Gravity	IS: 2720 (Part-3)-1980
Free Swell Index	IS:2720 (Part-40)-1977
Unconsolidated Undrained Triaxial shear test	IS: 2720 (Part-11)-1971
Consolidated Drained Direct Shear Test	IS: 2720 (Part-13)-1986
Unconfined Compression Test	IS: 2720 (Part-10)-1991
Consolidation test	IS: 2720 (Part-15)-1986
Chemical analysis of soil and groundwater to determine pH value, sulphates and chlorides	IS: 2720 (Part-27)-1977 IS: 2720 (Part-28)-1973 IS: 3025 -1964

All test results are presented on the Tables 1 to 3 and in the illustrations section of this report.

4.0 GENERAL SITE CONDITIONS

4.1 Site Stratigraphy

The area of the site is low lying. During rainy season, about 15-25 cm of standing water collects at the site.

At the site, a fill of 0.60-0.75 m is met. Below this, clayey silt / sandy silt is met to about 8.5 to 11.0 m depth (RL 90.0-87.5 m). This is underlain by silty sand / fine to medium sand to about 18.5 m depth (RL 80.0 m). Below this, clayey silt is met to about 20.0-22.0 m depth (RL 78.5-76.5 m). Below 20.0-22.0 m, fine to medium sand is met to the final explored depth of 30.0 m (RL 68.5 m).

Field SPT vales range from 5 to 9 to about 7.0 m depth (RL 91.5m). However at Borehole 3, a SPT value of 3 is met at 2.0 m depth (RL 96.5m). Below 7.0 m, SPT values range from 9 to 18 to



about 10.0 m depth (RL 88.5 m) and from 18 to 31 to about 22.0 m depth (RL 76.5 m). In underlying soils, SPT values increase and range from 42 to 61 (with some values exceeding 100) to the final explored dept of 30.0 (RL 68.5 m).

Detailed description of the materials encountered at the borehole locations is presented on the individual soil profiles on Tables 1 to 3. Engineering terms used for describing soils are explained on Table 4. Table 5 presents chemical test results of soil and groundwater. A pictorial summary of the borehole profiles is presented on Fig. 2. Corrected SPT values are plotted on Fig.3.

4.2 Groundwater

Based on our measurement in the completed boreholes, groundwater was encountered between 4.30 to 4.65 m depth (RL 94.2m to 93.85 m) below the existing ground level at the time of our field investigation (May, 2004). Fluctuations of upto 2 to 3 m may occur in measured water level due to seasonal variations in rainfall and surface evaporation rates. The area is prone to cyclones and heavy rains due to which substantial standing water may collect at the site.

5.0 CONCEPTS FOR ANALYSIS

5.1 Bearing Capacity for Shallow Foundations

Bearing capacity analysis for shallow foundations has been done in accordance with IS:6403-1981. The following equation has been used for the analysis:

$$q_{net\ safe} = \frac{1}{F} [cN_c \zeta_c d_c + p(N_q - 1) \zeta_q d_q + 0.5 B \gamma N_\gamma \zeta_\gamma d_\gamma R_w]$$

where :

$q_{net\ safe}$ = safe net bearing capacity of soil based on the shear failure criterion.

c = cohesion intercept

ϕ = angle of internal friction

γ = total unit weight of soil



p = overburden pressure
 B = width of foundation
 R_w = water table correction factor
 F = Factor of safety, taken as equal to 2.5 in accordance with IS:1904

N_c, N_q, N_γ = Bearing capacity factors which are a function of ϕ .

$\zeta_c, \zeta_q, \zeta_\gamma$ = Shape factors. For Strip footings, $\zeta_c = \zeta_q = \zeta_\gamma = 1$

For Square footing, $\zeta_c = 1.3, \zeta_q = 1.2, \zeta_\gamma = 0.6$

d_c, d_q, d_γ = Depth factors

For $\phi \leq 10, d_c = 1 + 0.2 \tan (45 + \phi/2) D/B, d_q = d_\gamma = 1$

For $\phi > 10, d_q = d_\gamma = 1 + 0.1 \tan (45 + \phi / 2) D/B$

Depending upon the soil conditions, either general shear failure condition or average of local and general shear failure conditions or local shear failure conditions has been used for the analysis.

5.2 Settlement Analysis for Shallow Foundations

Settlement analysis has been performed based on immediate settlement computations by elastic theory as per procedure given by Bowles⁽¹⁾ and consolidation settlement [Clauses 9.2.2 and 9.2.3 of IS 8009 (Part 1) 1976]. As per IS 1904, the tolerable total settlement is taken as 50 mm.

The total settlement is computed as the sum of the elastic settlement and the consolidation settlement. The elastic settlement has been computed using the following equation [Clause 9.2.3 of IS 8009 Part 1-1976].

$$S_i = \frac{qB'(1 - \mu^2)}{E} l d, d.$$

where :

S_i = immediate (elastic) settlement

B = foundation width, $B' = B/2$

⁽¹⁾ Bowles, J.E. (1996), "**Foundation Analysis and Design**", International Edition, pp. 303-317.



- μ = Poisson's ratio
 q = applied bearing pressure
 E = modulus of elasticity
 d_f = depth factor
 d_r = rigidity factor
 I = influence factor at corner of rectangular loaded area (B' x L')

The consolidation settlement of the cohesive soils has been computed using the following equation [Clause 9.2.2. of IS 8009 (Part-1)-1976].

$$S_c = \frac{c_c H}{1 + e_o} \left[\log \left(\frac{p + \Delta p}{p} \right) \right] \lambda_{oed} d_r d_f$$

where :

- S_c = consolidation settlement
 c_c = compression index
 e_o = initial void ratio
 p = overburden pressure
 λ_{oed} = oedometer correction factor, taken as equal to 0.7

5.3 Axial Capacity of Bored Piles

The axial compressive capacity for bored piles has been computed based on static analysis using c- ϕ values as interpreted from the site stratigraphy and laboratory test results.

The ultimate pile compressive capacity has been computed using the following equation as given in IS 2911 Part-I Section 2.

$$Q_{ult} = \left[\sum_{i=1}^n f_s A_s L_{si} \right] + q_u A_p$$
$$= \left[\sum_{i=1}^n (\alpha c_i + p_i k \tan \delta_i) A_s L_{si} \right] + [c_p N_c + q_p N_q + 0.5 D_r N_\gamma] A_p$$



where :

- Q_{ult} = ultimate pile capacity
 f_s = unit skin friction
 α = adhesion factor, taken as 0.5 under compressive loading
 c_i = cohesion intercept in i^{th} layer
 p_i = overburden pressure at centre of i^{th} layer
 k = coefficient of lateral earth pressure, taken as 1.5 under compressive loading
 δ_i = angle of friction between soil and pile (taken as equal to ϕ_i) for the i^{th} layer
 A_s = surface area of pile per m length
 L_i = length of pile section in i^{th} layer
 c_p = cohesion intercept in bearing strata
 q_u = unit end bearing
 q_p = overburden pressure in bearing strata
 N_c, N_q = bearing capacity factors, which are a function of ϕ in the bearing strata
 A_p = pile cross sectional area

The overburden pressure is assumed to become constant below depth of about 20 pile diameters.

6.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS

6.1 General

A suitable foundation for any structure should have an adequate factor against exceeding the bearing capacity of the supporting soils. Also the vertical movements due to compression of the soils should be within tolerable limits for the structure. We consider that foundation designed in accordance with the recommendations herein will satisfy these criteria.

6.2 Foundation Type and Depth

A SPT value of 3.0 is met to about 2.0 m depth in Borehole 3. Below this, SPT values increase with depth and range from 5 to 9 to 7.0 m depth.



Open spread foundations and strip footings (including brickwall type spread footings) may be used to support the structural loads. We recommend a minimum foundation depth of 2.0 m (RL 96.5 m) below existing ground level. A plinth beam interconnecting the foundations should be provided in order to give rigidity to the structure, to restrict differential settlement within tolerable limits for the structure.

Alternatively, pile foundations may be used to support the structural loads. Recommendations are presented herewith for 400 mm and 500 mm diameter RCC bored cast-in-situ piles.

6.3 Shallow Foundations

Open foundations bearing at or below about 2.0 m depth (RL 96.5 m) is a suitable foundation scheme.

Soil parameters used for foundation analysis are as follows:

For 2.0 m depth (RL 96.5 m) :

$$\begin{array}{llll} c = 5.80 \text{ T/m}^2 & \phi = 0 \text{ degrees} & \gamma = 1.80 \text{ T/m}^3 & \\ c' = 3.87 \text{ T/m}^2 & \phi' = 0 \text{ degrees} & & \\ N_o' = 5.14 & N_q' = 1.00 & N_\gamma' = 1.80 & \text{Local Shear Failure} \end{array}$$

For 3.0 m depth (RL 95.5 m) :

$$\begin{array}{llll} c = 6.70 \text{ T/m}^2 & \phi = 0 \text{ degrees} & \gamma = 1.80 \text{ T/m}^3 & \\ c' = 4.47 \text{ T/m}^2 & \phi' = 0 \text{ degrees} & & \\ N_o' = 5.14 & N_q' = 1.00 & N_\gamma' = 0 & \text{Local Shear Failure} \end{array}$$

The bearing capacity equation as given in Section 5.1 has been used for the analysis. For the soil conditions encountered at the site, local shear failure has been used for analysis.

Settlement analysis has been performed in accordance with IS 8009 Part I. The computation has been done by computing the settlement using the elastic and consolidation theory. The detailed procedure is given in section 5.2 of this report. As per IS:1904, the tolerable settlement is taken as 50 mm. The groundwater is considered to rise to ground level for design purpose.



Soil parameters used for the settlement analysis for the proposed structure are as follows:

RL, m		Soil Classification	γ T/m ³	E T/m ²	μ	P_c	e_a	C_{c1}	C_{c2}
From	To								
98.5	97.7	FILL	1.60						
97.7	93.5	Clayey Silt/ Sandy silt	1.75	350	0.4	14	0.70	0.022	0.200
93.5	88.5	Clayey Silt/ Sandy silt	1.85	600		23	0.67	0.019	0.190
88.5	80.0	Fine to medium sand	1.90	1000					
80.0	76.5	Clayey silt	1.95	1000		30	0.66	0.017	0.160
76.5	68.5	Fine to medium sand	2.00	1200					

Based on a detailed analysis for foundations of different sizes, we recommend the following values of net bearing pressure at or below RL 96.5 m (2.0 m below EGL).

RL of Foundation Embedment, m	Foundation Embedment Depth, m	Foundation Width, m	Recommended Net Allowable Bearing Pressure, T/m ²
96.5	2.0	1	10.0
		2	8.5
		≥3	7.0
95.5	3.0	1	14.0
		2	12.0
		≥3	10.0

The above values include a bearing capacity factor of 2.5. Total settlement of foundations designed for the above recommended values of net bearing pressure is estimated to be about 50 mm. A plinth beam interconnecting the foundations should be provided in order to give rigidity to the structure and to restrict differential settlement. Net bearing pressures for foundations at intermediate levels may be interpolated linearly between the values given above. Typical calculations are enclosed at the end of the report.



6.4 Pile Foundations

RCC bored cast-in-situ piles may be provided to support the structural loads. Recommendations are presented herewith for 400 mm and 500 mm diameter piles. The cut-off-level has been taken at RL 97.5 m (1.0 m below ground level).

Parameters used for pile capacity analysis are as follows :

RL, m		Soil Classification	c, T/m ²	φ°	γ, T/m ³	k	α	N _c	N _q	N _y
From	To									
98.5	97.7	Fill	-	-	1.60					
97.7	95.5	Clayey silt/ sandy silt	5.8	0	1.75	1.5	0.5			
95.5	92.5	Clayey silt/ sandy silt	6.7	0	1.80	1.5	0.5			
92.5	88.5	Clayey silt/ sandy silt	7.6	0	1.85	1.5	0.5			
88.5	80.0	Fine to coarse sand	0.0	31	1.90	1.5			23.93	25.99
80.0	76.5	Clayey silt/ sandy silt	11.0	5	1.95	1.5	0.5	9.0	1.57	0.45
76.5	68.5	Fine to medium sand	0.0	33	2.00	1.5			34.86	35.19

The following table represents our recommended values of safe axial compressive load for 400 and 500mm diameters bored cast-in-situ piles.

Reduced level of pile Tip, m	Pile Length below COL, m	Recommended Safe Compressive Capacities, Tonnes	
		Dia = 400 mm	Dia = 500 mm
85.5	12.0	32	49
83.5	14.0	38	58
81.5	16.0	42	61
79.5	18.0	48	70
77.5	20.0	54	78



The above pile capacities include a safety factor of 2.5. The pile capacities at intermediate depths may be interpolated linearly between the values given above. These capacities may be used as a guideline for preliminary design. Final capacities should be confirmed in site by initial pile load test as per IS specifications. Typical calculations are given at the end of this report.

6.5 Definition of Gross and Net Bearing Pressure

For the purposes of this report, the net allowable bearing pressure should be calculated as the difference between total load on the foundation and the weight of the soil overlying the foundation divided by the effective area of the foundation. The gross bearing pressure is the total pressure at the foundation level including overburden pressure and surcharge load. The following equations may be used -

$$q_{\text{net}} = [(P_s + W_f + W_s) / A_f] - S_v$$
$$q_{\text{gross}} = q_{\text{net}} + S_v = (P_s + W_f + W_s) / A_f$$

where:

q_{net} = net allowable bearing pressure

q_{gross} = gross bearing pressure

P_s = superimposed static load on foundation

W_f = weight of foundation

W_s = weight of soil overlying foundation

A_f = effective area of foundation

S_v = overburden pressure at foundation level prior to excavation for foundation.

It may please be noted that safe bearing pressures recommended in this report refer to "**net values**".



6.6 Liquefaction Potential

Liquefaction is likely in soil deposits consisting of loose sands (SP) below water table with SPT N-values less than 15. At shallow depths, the soil deposits consist of clayey silt / sandy silt with N-values less than 15. The sands below water table classify as SP and SP-SM with N-values more than 15. Groundwater is met at 4.30~4.65 m depth.

Reviewing the soil conditions, SPT values, soil gradation and depth of water table, we are of the opinion that the liquefaction potential for the soils at the site during earthquake is low. No specific measures are considered warranted.

In our opinion, provision of plinth beam interconnecting the column / footings as well as earthquake bands at lintel level are sufficient to ensure stability of the proposed building during earthquakes.

7.0 FOUNDATION CONSTRUCTION CONSIDERATIONS

7.1 Excavation

Temporary open cut excavation through soil to about 2.0 to 3.0m depth may be cut using side slopes of 1 - vertical on 0.3 to 0.4 - horizontal. The excavation slopes should be monitored by the engineer. If excessive sloughing or caving occurs, the slopes may be flattened to ensure stability.

7.2 Foundation Level Preparation

The exposed foundation bearing surface should be watered and compacted properly using light manual rammers/rollers. The surface should then be protected from disturbances due to construction activities so that the foundations may bear on the natural undisturbed ground. For all shallow foundations and pile caps, we recommend the placement of a 75 to 100 mm thick "blinding layer" of lean concrete to facilitate placement of reinforcing steel and to protect the soils from disturbance.



7.3 Pile Construction

In case piles are planned, a properly mixed drilling mud should be used to control the caving of the borehole during drilling and concreting. Use of tremie concreting is recommended in order that the groundwater does not mix with the fresh concrete. The concrete should be coherent, with a minimum cement content of 400 kg/cu.m. for M25 grade of concrete and should have a slump of about 150 to 180 mm.

7.4 Pile Load Tests

In case pile foundations are planned, we recommend that load tests be conducted on piles in order to confirm the static capacities and to ensure proper performance of the piles. A programme of initial load tests and routine load tests should be drawn up and sufficient number of piles should be tested in accordance with IS : 2911 Part-IV in order to ensure that the safe load on the pile is either equal to or greater than the working load on the piles.

7.5 Chemical Attack

Chemical test results on soil and groundwater are presented on Table 5. The results indicate that the soils contain sulphate in the range of 0.10 to 0.12 percent and chlorides in the range of 0.02 to 0.04 percent. The groundwater contains 361 to 412 mg / litre of sulphates and 170 to 210 mg / litre of chlorides. The pH value of soil is between 8.3 to 8.6 and that of groundwater is between 7.6 to 8.0 indicating somewhat alkaline condition.

IS:456-2000 recommends that precautions should be taken against chemical degradation of concrete if the sulphates content of the soils exceeds 0.2 percent or if the groundwater contains more than 300 mg per litre of sulphates (SO_3).

Comparing the test results with these specified limits, the sulphate content of the soils is less than the specified limit; however the sulphate content of the groundwater is above the specified limit. The strata falls in Class 2 classification as described on IS 456 – 2000 which indicates a medium potential for corrosion.



In our opinion, the groundwater is marginally aggressive to concrete. We recommend the following measures as a good practice to limit the potential for chemical attack :

- (1) For shallow foundations and pile caps, the concrete should contain a minimum cement content of 330 kg/m^3 . Concrete for pile foundations should contain at least 400 kg/m^3 of cement. Ordinary Portland cement may be used for concrete.
- (2) Water cement ratio in foundation concrete should not exceed 0.55.
- (3) A clear concrete cover over the reinforcement steel of at least 40 mm should be provided for all foundations.
- (4) The concrete for shallow foundations and pile caps should be densified adequately using a vibrator so as to form a dense impervious mass.

7.6 Variability in Subsurface Conditions

Subsurface conditions encountered during construction may vary somewhat from the conditions encountered during the site investigation. In case significant variations are encountered during construction, we request to be notified so that our engineers may review the recommendations in this report in light of these variations.

8.0 SUMMARY OF PRINCIPAL FINDINGS AND RECOMMENDATIONS

Cengrs Geotechnica Private Limited conducted a geotechnical investigation for the expansion of hospital building at Sardar Vallabhbai Patel Post Graduate Institute of Pediatrics, Cuttack, Orissa. The scope of work included three boreholes upto 30.0 m depth.

A loose heterogeneous fill of soil is met at the surface, which extends to 0.6-0.8 m depth. The natural soils below fill consist of clayey silt / sandy silt to 8.5-11.0 m depth (RL 90.0-87.5 m) underlain by fine to medium sand to about 18.5 m (RL 80.0 m). Below this, clayey silt is met to about 20.0-22.0 m depth (RL 78.5-76.5 m). Below this, fine to medium sand is met to the final explored depth of 30.0 m (RL 68.5 m).



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204050-B

Sheet No. 15

Groundwater was encountered between 4.30 to 4.65 m depth (RL 94.2 to 93.85 m) below the existing ground level at the time of our field investigation (May, 2004).

We recommend the following alternative schemes.

Open Foundations: At 2.0 m embedment depth (RL 96.5m), we recommend a net allowable bearing pressure of 8.5 T/m^2 for 2 m wide foundation and 7.0 T/m^2 for ($\geq 3.0\text{m}$) wide foundation.

At 3.0 m embedment depth (RL 95.5m), we recommend a net allowable bearing pressure of 12.0 T/m^2 for 2 m wide foundation and 10 T/m^2 for ($\geq 3.0\text{m}$) wide foundation.

A plinth beam interconnecting the columns / foundation should be provided in order to give rigidity to the structure and to restrict differential settlement.

Pile Foundations: For a 12 m long pile (pile tip at RL 85.5 m), safe compressive capacity for 400 mm diameter pile may be adopted as 32 tonnes and for 500mm diameter pile as 49 tonnes. For 18 m long pile (pile tip at RL 79.5 m), safe compressive capacity for 400 mm diameter pile is 48 tonnes and for 500 mm diameter pile is 70 Tonnes.

9.0 CLOSURE

We appreciate the opportunity to perform this investigation for you and have pleasure in submitting this report. Please contact us when we can be of further service to you.

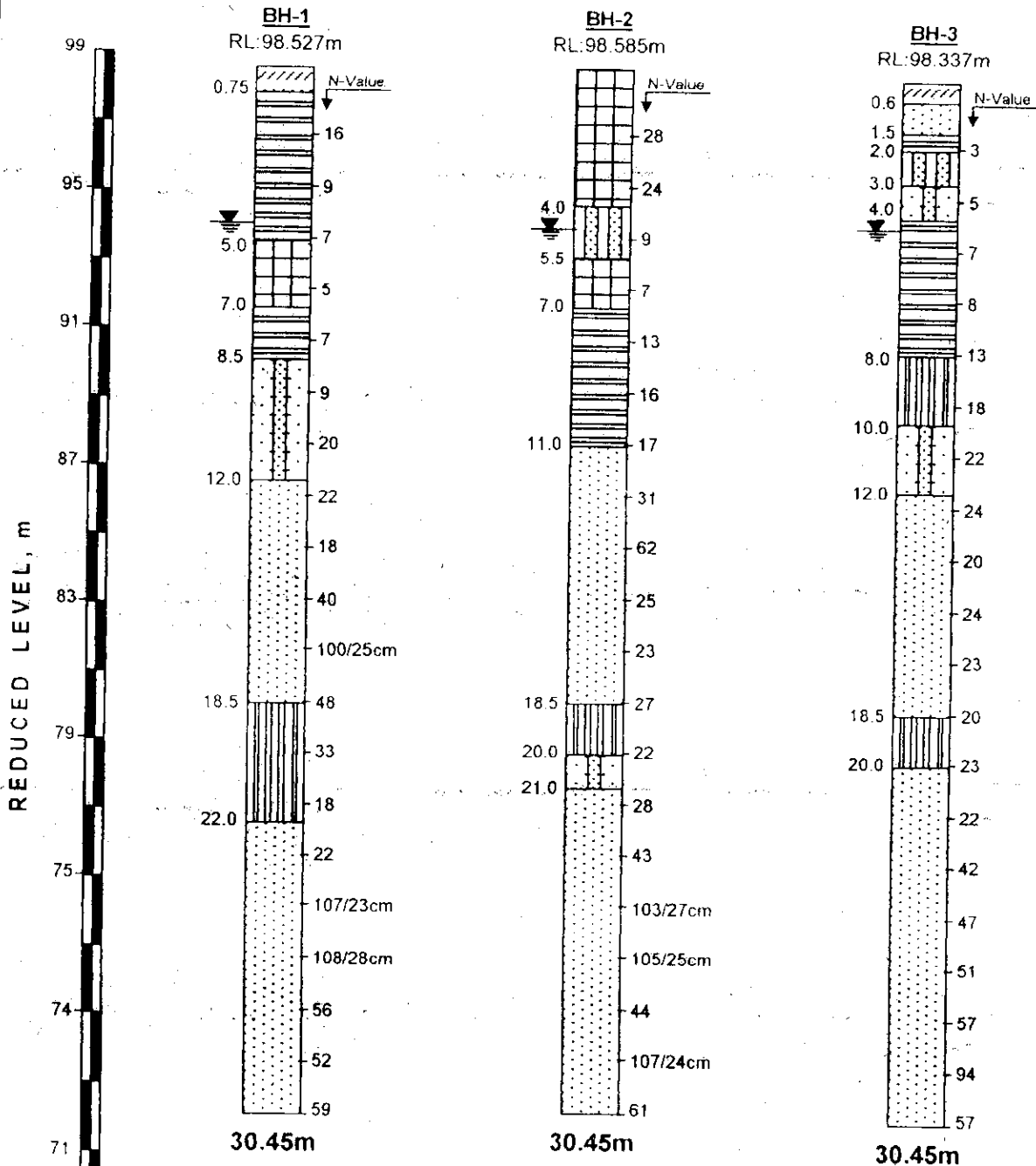
for CENGRS GEOTECHNICA PRIVATE LIMITED

Ravi Sundaram

Sanjay Gupta

(RAVI SUNDARAM)
DIRECTOR

(SANJAY GUPTA)
MANAGING DIRECTOR



SUMMARY OF BOREHOLE PROFILE
Sardar Vallabh Patel Post Graduate Institute of
Pediatrics at Cuttack, Orissa

LEGEND	
SYMBOL	DESCRIPTION
	FILL
	Sandy silt (CL)
	Clayey silt (MI)
	Fine sand (SP-SM)
	Silty fine sand (SM)
	Fine sand (SP)
	Silty clay (MH)
	Water Table



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204120

Sheet No. i

FINAL REPORT ON :
ADDITIONAL GEOTECHNICAL INVESTI-
GATION AT S.V.P. POST GRADUATE
INSTITUTE OF PAEDIATRICS AT
CUTTACK (ORISSA)

Submitted to:

The Consortium of
Yokogawa Architects & Engineers, Inc. and
Daiichi Health Care Facility Consultants Inc.
2-20-28, Shimomeguro, Meguro-Ku
Tokyo, Japan



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204120

Sheet No. ii

TABLE OF CONTENTS

	<u>Sheet No.</u>
1.0 INTRODUCTION	1
1.1 Project Description	1
1.2 Purposes of Study	1
2.0 FIELD INVESTIGATIONS	1
2.1 Soil Borings	1
2.2 Groundwater	2
3.0 LABORATORY TESTS	2
4.0 GENERAL SITE CONDITIONS	3
4.1 Site Stratigraphy	3
4.2 Groundwater	4
5.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS	4
5.1 General	4
5.2 Area Distribution of Soil Conditions	4
5.3 Foundation Type and Depth	5
5.4 Shallow Foundations	6
5.5 Pile Foundations	6
5.6 Definition of Gross and Net Bearing Pressure	7
6.0 CLOSURE	8



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204120

Sheet No. iii

TABLES

Table No.

Soil Profiles	1
Engineering Description of Soils	2
Chemical Test Results	3

ILLUSTRATIONS

Fig. No.

Plan of Field Investigation	1
Summary of Borehole Profile	2
Standard Penetration Test Results	3
Grain Size Analysis	4 to 6
Shear Test Results	7 to 9



1.0 INTRODUCTION

1.1 Project Description

Sardar Vallabhbai Patel Post Graduate Institute of Paediatrics at Cuttack, Orissa is planning to expand its facilities. A two storey building is planned with covering an area to about 5000 m². M/s. Yokogawa Architects & Engineers, Inc. and Daiichi Health Care Facility Consultants Inc., Tokyo, Japan is the project consultant for this project.

Previously three boreholes were drilled at the site. Our report on these three boreholes has been submitted to M/s. Yokogawa Architects & Engineers, Inc. vide our Report No. 204050-B.

To reconfirm the site stratigraphy and the extent of loose soils at the site, Yokogawa requested to Cengrs to do one more borehole, designated as BH-4. This report presents the results together with our recommendations. A layout plan showing the locations of our current and previous field investigation is illustrated in Fig.1.

1.2 Purposes of Study

The overall purposes of this study are to reconfirm the stratigraphy at the site and to develop geotechnical recommendations for foundation design and construction. To accomplish these purposes, the current study was conducted in the following phases:

- (a) drilling one boreholes to 30 m depth or refusal, whichever is earlier in order to determine site stratigraphy and to collect soil samples for laboratory testing;
- (b) testing selected soil samples in the laboratory to determine pertinent index and engineering properties of the soils ; and
- (c) analyzing all field and laboratory data in order to develop engineering recommendations for foundation design and construction.

2.0 FIELD INVESTIGATIONS

2.1 Soil Borings

The borings were progressed using a shell and auger to the specified depth or refusal, whichever is encountered earlier. The diameter of borehole was 150 mm. Where caving of the borehole occurred, casing was used to keep the borehole stable. The work was in general accordance with IS:1892-1979.



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204120

Sheet No. 2

Standard Penetration Tests (SPT) were conducted in the boreholes at 1.5 m depth intervals by connecting a split spoon sampler to 'A' rods and driving it by 45 cm using a 63.5 kg hammer falling freely from a height of 75 cm. The tests were conducted in accordance with IS:2131-1981.

The number of blows for each 15 cm of penetration of the split spoon sampler was recorded. The blows required to penetrate the initial 15 cm of the split spoon for seating the sampler is ignored due to the possible presence of loose materials or cuttings from the drilling operation. The cumulative number of blows required to penetrate the balance 30 cm of the 45 cm sampling interval is termed the SPT value or the 'N' value.

The 'N' values are presented on the soil profile for each borehole. Refusal to further boring penetration was considered when the 'N' values exceed 100 or when practical refusal to further penetration by shell and auger was encountered.

Disturbed samples were collected from the split spoon after conducting SPT. The samples were preserved in transparent polythene bags. Undisturbed samples were collected by attaching 100 mm diameter thin walled 'Shelby' tubes and driving the sampler using a 63.5 kg hammer in accordance with IS: 2132-1986. The tubes were sealed with wax at both ends. All samples were transported to our Delhi laboratory for further examination and testing.

2.2 Groundwater

Groundwater level was measured in the boreholes 24 hours after drilling and sampling was completed. The measured water levels are recorded on the individual soil profiles.

3.0 LABORATORY TESTS

The laboratory testing programme was aimed at verifying the field classifications and developing parameters for engineering analysis. All tests were performed in accordance with the current applicable IS specifications. The following tests were conducted on selected soil and water samples recovered from the borehole:



Laboratory Test	Applicable IS: Code
Natural moisture content	IS: 2720 (Part-2)-1973
Grain size analysis	IS: 2720 (Part-4)-1985
Liquid and Plastic limit	IS: 2720 (Part-5& 6)-1985
Specific Gravity	IS: 2720 (Part-3)-1980
Free Swell Index	IS:2720 (Part-40)-1977
Unconsolidated Undrained Triaxial shear test	IS: 2720 (Part-11)-1971
Consolidated Drained Direct Shear Test	IS: 2720 (Part-13)-1986
Chemical analysis of soil and groundwater to determine pH value, sulphates and chlorides	IS: 2720 (Part-27)-1977 IS: 2720 (Part-26)-1973 IS: 3025 (Part-24)-1986 IS: 3025 (Part-32)-1988

All test results are presented on the Table 1 and in the illustrations section of this report.

4.0 GENERAL SITE CONDITIONS

4.1 Site Stratigraphy

The soil conditions and SPT N - values of BH-4 of current investigation are compare well with the previously drilled BH-3. At location, silty fine sand is met to 4.0 m depth (RL 94.5 m). Below this, clayey silt is met to 7.5 m depth (RL 91.0 m). This is underlain by silty clay of high plasticity and medium expansive in nature to about 10.0 m depth (RL 88.5 m). Below this, fine to medium sand is met to the final explored depth of 30.0 m (RL 68.5 m).

At Borehole 1 & 2, SPT values range from 7 to 13 to about 9.0 m depth (RL 89.5 m). However, at Boreholes 3 & 4, SPT values range from 3 to 13 to 9.0 m depth (RL 89.5 m). At Boreholes 3 & 4, SPT values are as low as 3 to 5 to about 3.0~4.0 m depth.

Below 9.0 m depth, SPT values range from 18 to 22 to 11.0 m depth (RL 87.5m) and from 20 to 37 to 22.0 m depth (RL 76.5 m). In the underlying soils, SPT values increase and range from 46 to 61 to the final explored depth of 30.0 m (RL 68.5 m).



Laboratory Test	Applicable IS: Code
Natural moisture content	IS: 2720 (Part-2)-1973
Grain size analysis	IS: 2720 (Part-4)-1985
Liquid and Plastic limit	IS: 2720 (Part-5& 6)-1985
Specific Gravity	IS: 2720 (Part-3)-1980
Free Swell Index	IS:2720 (Part-40)-1977
Unconsolidated Undrained Triaxial shear test	IS: 2720 (Part-11)-1971
Consolidated Drained Direct Shear Test	IS: 2720 (Part-13)-1986
Chemical analysis of soil and groundwater to determine pH value, sulphates and chlorides	IS: 2720 (Part-27)-1977 IS: 2720 (Part-26)-1973 IS: 3025 (Part-24)-1986 IS: 3025 (Part-32)-1988

All test results are presented on the Table 1 and in the illustrations section of this report.

4.0 GENERAL SITE CONDITIONS

4.1 Site Stratigraphy

The soil conditions and SPT N - values of BH-4 of current investigation are compare well with the previously drilled BH-3. At location, silty fine sand is met to 4.0 m depth (RL 94.5 m). Below this, clayey silt is met to 7.5 m depth (RL 91.0 m). This is underlain by silty clay of high plasticity and medium expansive in nature to about 10.0 m depth (RL 88.5 m). Below this, fine to medium sand is met to the final explored depth of 30.0 m (RL 68.5 m).

At Borehole 1 & 2, SPT values range from 7 to 13 to about 9.0 m depth (RL 89.5 m). However, at Boreholes 3 & 4, SPT values range from 3 to 13 to 9.0 m depth (RL 89.5 m). At Boreholes 3 & 4, SPT values are as low as 3 to 5 to about 3.0~4.0 m depth.

Below 9.0 m depth, SPT values range from 18 to 22 to 11.0 m depth (RL 87.5m) and from 20 to 37 to 22.0 m depth (RL 76.5 m). In the underlying soils, SPT values increase and range from 46 to 61 to the final explored depth of 30.0 m (RL 68.5 m).



The SPT values at shallow depth indicate weak soil conditions in the western half of the site (BH 3 & 4). In the eastern half of the site (BH 1 & 2), the soil conditions are relatively better.

Detailed description of the materials encountered at the borehole location is presented on the individual soil profile on Table 1. Engineering terms used for describing soils are explained on Table 2. Table 3 presents chemical test results of soil and groundwater. A pictorial summary of the borehole profiles is presented on Fig. 2. Corrected SPT values are plotted on Fig.3.

4.2 Groundwater

Based on our measurement in the completed boreholes, groundwater was encountered between 4.30 to 4.65 m depth (RL 94.2 m to 93.85 m) below the existing ground level at the time of our previous field investigation (May, 2004). During current investigation (BH-4), groundwater was encountered at 3.75 m depth (RL 94.75 m) at the time of our field investigation (October, 2004). Fluctuations of upto 2 to 3 m may occur in measured water level due to seasonal variations in rainfall and surface evaporation rates. The area is prone to cyclones and heavy rains due to which substantial standing water may collect at the site.

5.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS

5.1 General

A suitable foundation for any structure should have an adequate factor against exceeding the bearing capacity of the supporting soils. Also the vertical movements due to compression of the soils should be within tolerable limits for the structure. We consider that foundation designed in accordance with the recommendations herein will satisfy these criteria.

5.2 Area Distribution of Soil Conditions

Reviewing the soil conditions and SPT N values, we have divided the site in two parts designated as Area-1 and Area-2.



These areas are illustrated on Figure-1. The demarcating line between the areas is marked along the grid axis 50 W. This line is an imaginary hypothetical line separating the two areas. The actual condition on site may vary from that shown on Figure 1 and may be a gradual transition instead of a clearly defined line.

Area-1 has been investigated by Borehole 1 & 2. In this area, SPT values range from 16 to 26 to about 2.0~3.0m depth. Below this, SPT values decrease somewhat and range from 7 to 9 to about 9.0 m depth. In this area, it is feasible to place open foundation at 2.0 m depth.

Area-2 has been investigated by Borehole 3 & 4. In this area, SPT values are as low as 3 to 5 to about 3.0~3.5 m depth. Below this, SPT values range from 7 to 13 to about 8.0 ~ 9.0 m depth. For open foundations, in this area, we recommend a minimum foundation depth of 3.0 m.

5.3 Foundation Type and Depth

Open spread foundations and strip footings (including brickwall type spread footings) may be used to support the structural loads. We recommend as follows:

- a) In Area-1, the minimum foundation depth for open foundation should be at least 2.0 m.
- b) In Area-2, the minimum foundation depth for open foundation should be at or below 3.0 m depth.

In case open foundations are planned, we suggest that a construction joint be provided along the 50 W line so as to isolate the foundations in two different areas. Alternatively, open foundations for whole building may be designed conservatively using the recommended values for Area-2. A plinth beam inter connecting the foundations should be provided in order to give rigidity to the structure and to restrict differential settlement.

Alternatively, pile foundation may be used to support the structural loads. Recommendations are presented herewith for 400 mm and 500 mm diameter RCC bored cast-in-situ piles.



5.4 Shallow Foundations

Based on a detailed analysis for foundations of different sizes (As covered in our Report No. 204050-B), we recommend the following values of net bearing pressure for Area-1 and Area-2.

Area	RL of Foundation Embedment, m	Foundation Embedment depth, m	Foundation Width, m	Recommended Net Allowable Bearing Pressure, T/m ²
Area-1	96.5	2.0	1	10.0
			2	8.5
			3	7.0
	95.5	3.0	1	14.0
			2	12.0
			3	10.0
Area-2	95.5	3.0	1	10.0
			2	8.5
			3	7.0
	94.5	4.0	1	14.0
			2	12.0
			3	10.0

The above values include a bearing capacity factor of 2.5. Total settlement of foundations designed for the above recommended values of net bearing pressure is estimated to be about 50 mm. A plinth beam interconnecting the foundations should be provided in order to give rigidity to the structure and to restrict differential settlement. Net bearing pressures for foundations at intermediate levels may be interpolated linearly between the values given above.

5.5 Pile Foundations

Based on detailed analysis for piles of different lengths (as given in our report no. 204050-B), we recommend the following values of safe axial compressive load capacities for 400 and 500mm diameters bored cast-in-situ piles. These pile capacities are applicable for both Area-1 and Area-2.



Reduced level of pile Tip, m	Pile Length below COL, m	Recommended Safe Compressive Capacities, Tonnes	
		Dia = 400 mm	Dia = 500 mm
85.5	12.0	32	49
83.5	14.0	38	58
81.5	16.0	42	61
79.5	18.0	48	70
77.5	20.0	54	78

The above pile capacities include a safety factor of 2.5. The pile capacities at intermediate depths may be interpolated linearly between the values given above. These capacities may be used as a guideline for preliminary design. Final capacities should be confirmed in site by initial pile load test as per IS specifications.

5.6 Definition of Gross and Net Bearing Pressure

For the purposes of this report, the net allowable bearing pressure should be calculated as the difference between total load on the foundation and the weight of the soil overlying the foundation divided by the effective area of the foundation. The gross bearing pressure is the total pressure at the foundation level including overburden pressure and surcharge load. The following equations may be used -

$$q_{net} = [(P_s + W_f + W_s) / A_f] - S_v$$
$$q_{gross} = q_{net} + S_v = (P_s + W_f + W_s) / A_f$$

where:

q_{net} = net allowable bearing pressure

q_{gross} = gross bearing pressure

P_s = superimposed static load on foundation

W_f = weight of foundation

W_s = weight of soil overlying foundation



CENGRS GEOTECHNICA PVT. LTD.

Job No. 204120

Sheet No. 8

A_f = effective area of foundation

S_v = overburden pressure at foundation level prior to excavation for foundation.

It may please be noted that safe bearing pressures recommended in this report refer to "*net values*".

6.0 CLOSURE

We appreciate the opportunity to perform this investigation for you and have pleasure in submitting this report. Please contact us when we can be of further service to you.

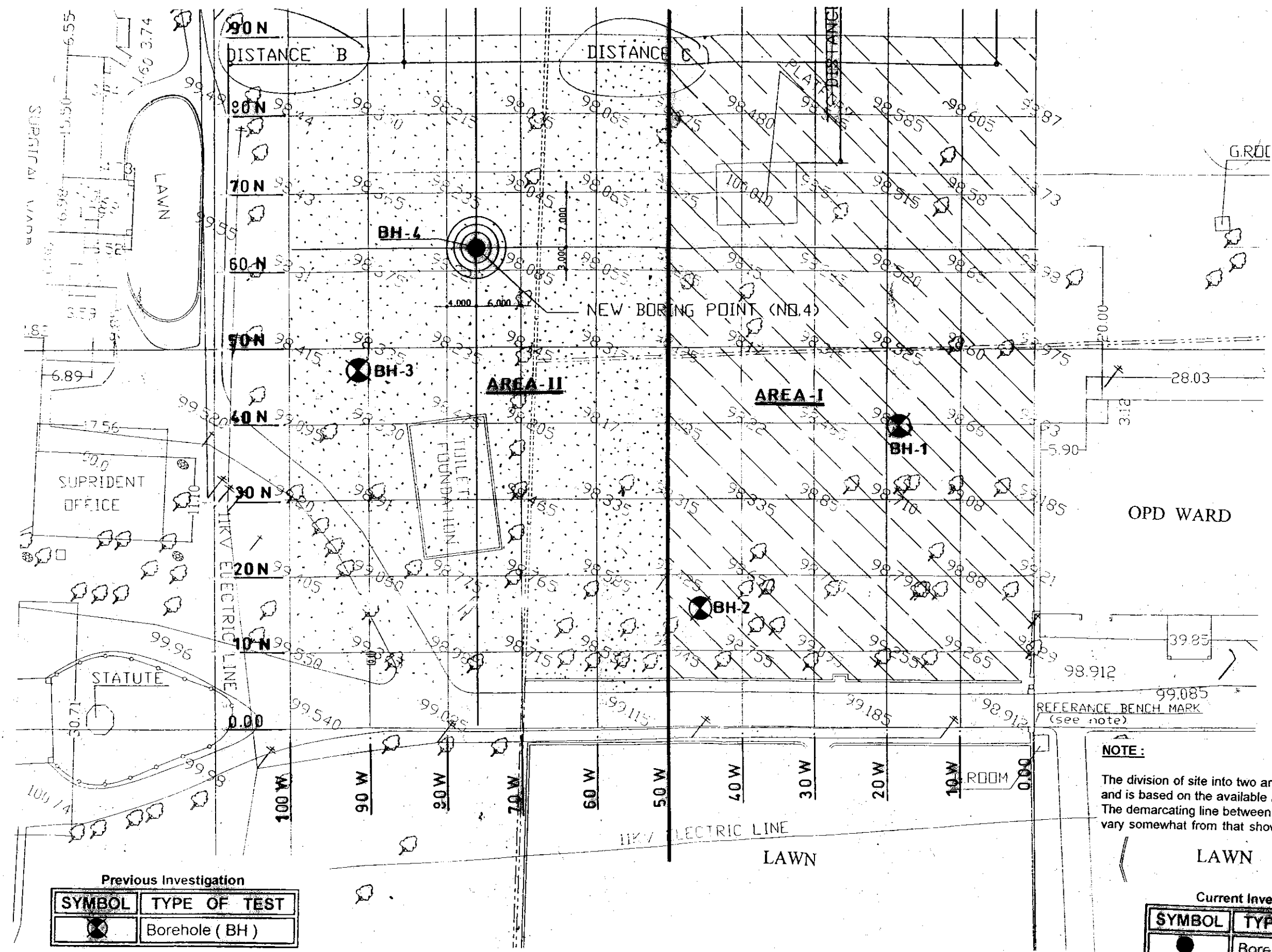
for CENGRS GEOTECHNICA PRIVATE LIMITED



Ravi Sundaram

Sanjay Gupta

(RAVI SUNDARAM)
DIRECTOR


(SANJAY GUPTA)
MANAGING DIRECTOR




-  - AREA - I
-  - AREA - II

NOTE :
 The division of site into two areas is approximate and is based on the available borehole data only. The demarcating line between the two areas may vary somewhat from that shown in this drawing.

Previous Investigation

SYMBOL	TYPE OF TEST
	Borehole (BH)

Current Investigation

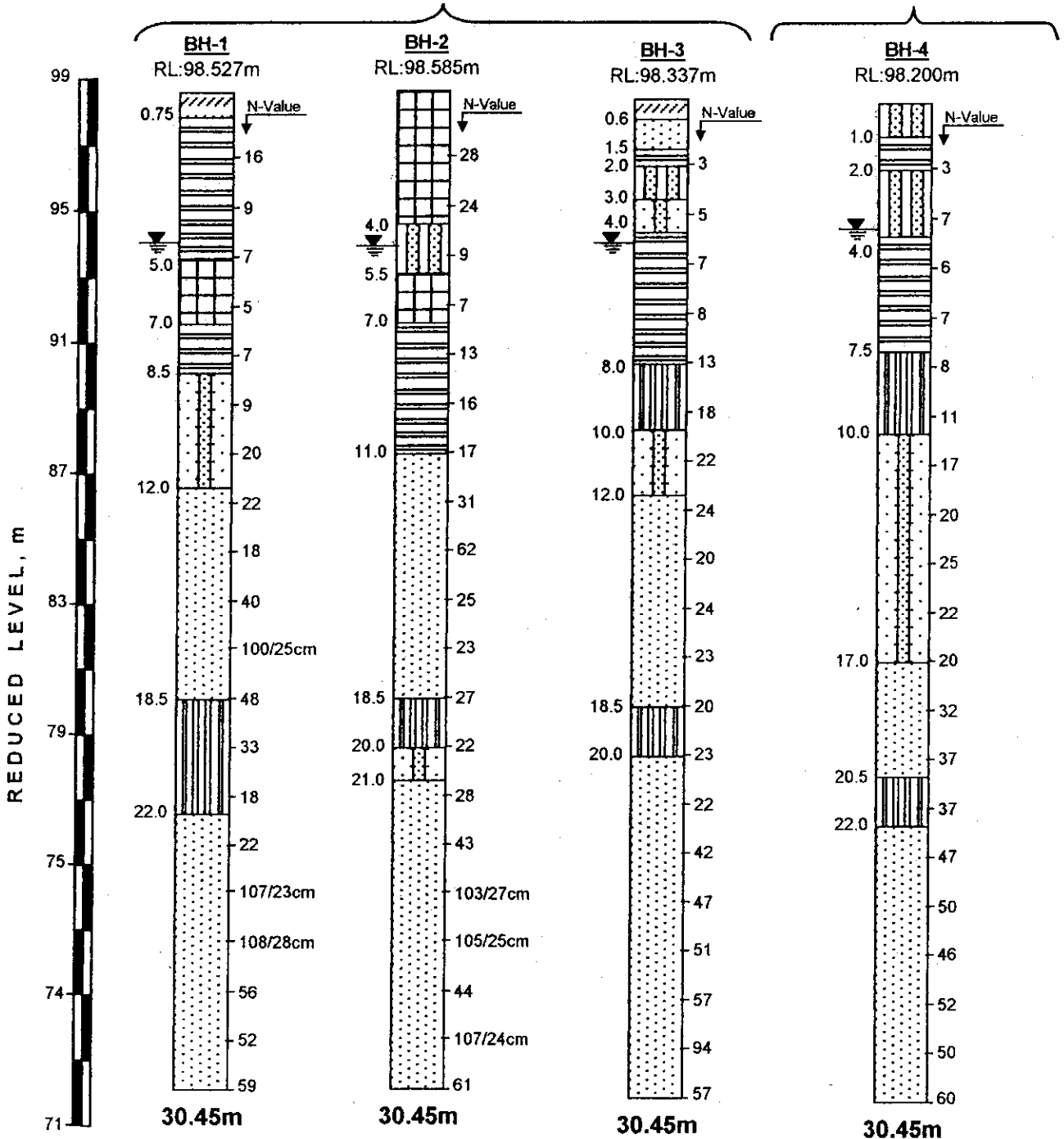
SYMBOL	TYPE OF TEST
	Borehole (BH)

PLAN OF FIELD INVESTIGATION
 Sardar Vallabhbai Patel Post Graduate Institute of Pediatrics at Cutack, Orissa



PREVIOUS INVESTIGATION

CURRENT INVESTIGATION



LEGEND	
SYMBOL	DESCRIPTION
	FILL
	Sandy silt (CL)
	Clayey silt (MI)
	Fine sand (SP-SM)
	Silty fine sand (SM)
	Fine sand (SP)
	Silty clay (MH)
	Water Table

SUMMARY OF BOREHOLE PROFILE
Sardar Vallabh Patel Post Graduate Institute of
Pediatrics at Cuttack, Orissa

9. インド国側負担経費 概算根拠

1. 建設予定地整地

(1) 障害物撤去

1) 既存トイレ基礎撤去 (11m × 17m)		63,000	ルビ -
2) 既存井戸撤去		171,000	ルビ -
3) 既存道路撤去	$126\text{m}^2 \times 450\text{ルビ} - / \text{m}^2 =$	56,700	ルビ -
	小計	290,700	ルビ -
		291,000	ルビ -

(2) 樹木伐採 (26本)

141,750	ルビ -
142,000	ルビ -

(3) 排水路切り直し

1) 新排水路掘削工事	$176\text{m} \times 4,500\text{ルビ} - / \text{m} =$	792,000	ルビ -
2) 旧排水路埋め戻し	$177\text{m} \times 4,500\text{ルビ} - / \text{m} =$	796,500	ルビ -
	小計	1,588,500	ルビ -
		1,589,000	ルビ -

合計 2,022,000 ルビ -

2. 既存棟改修

(1) 旧内科病棟

1) 内壁ペイント	$1,048\text{m}^2 \times 107.1\text{ルビ} - / \text{m}^2 =$	112,240.8	ルビ -
2) 機材メンテナンスショップ改修	$50\text{m}^2 \times 1,000\text{ルビ} - / \text{m}^2 =$	50,000.0	ルビ -
	小計	162,240.8	ルビ -
		162,000.0	ルビ -

(2) 現外科病棟

1) 内壁ペイント	$1,280\text{m}^2 \times 107.1\text{ルビ} - / \text{m}^2 =$	137,088	ルビ -
2) 手術室改修	$170\text{m}^2 \times 1,000\text{ルビ} - / \text{m}^2 =$	170,000	ルビ -
	小計	307,088	ルビ -
		307,000	ルビ -

(3) 外来診療棟: 連絡通路(現未使用トイレ)改修

1) コンクリート	$4\text{m}^3 \times 3,110.3\text{ルビ} - / \text{m}^3 =$	12,441.72	ルビ -
2) モルタル仕上げ: 床	$12\text{m}^2 \times 186.84\text{ルビ} - / \text{m}^2 =$	2,242.08	ルビ -
3) モルタル仕上げ: 壁	$48\text{m}^2 \times 202.5\text{ルビ} - / \text{m}^2 =$	9,720.00	ルビ -
4) ペイント塗装: 壁	$48\text{m}^2 \times 107.1\text{ルビ} - / \text{m}^2 =$	5,140.80	ルビ -
5) ペイント塗装: 天井	$12\text{m}^2 \times 107.1\text{ルビ} - / \text{m}^2 =$	1,285.20	ルビ -
6) 壁撤去	$2ヶ所 \times 10,000\text{ルビ} - / \text{ヶ所} =$	20,000.00	ルビ -
	小計	50,829.80	ルビ -
		51,000.00	ルビ -

(4) 新内科棟 内壁ペイントのみ

$1,640\text{m}^2 \times 107.1\text{ルビ} - / \text{m}^2 =$	175,644	ルビ -
	176,000	ルビ -

合計 696,000 ルビ -

3. 植栽

(1) 芝生	$1,500\text{m}^2 \times 200\text{ルビ} - / \text{m}^2 =$	300,000	ルビ -
(2) 低木 (H:1.0m)	$70\text{本} \times 500\text{ルビ} - / \text{本} =$	35,000	ルビ -
	合計	335,000	ルビ -