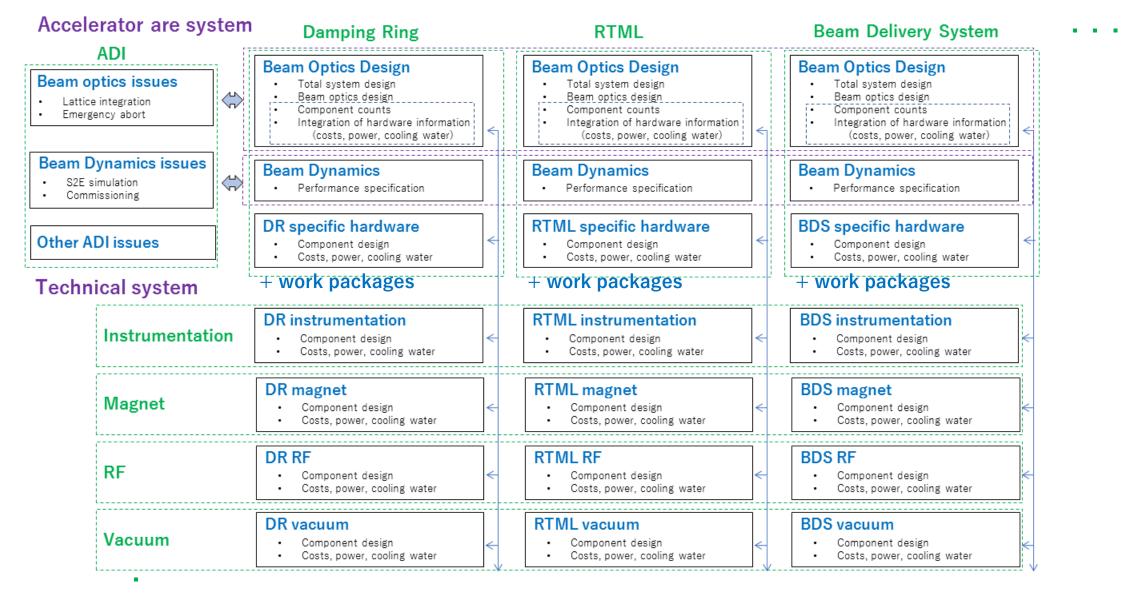
Discussion of WBS for DR/RTML/BDS area systems

2021/05/12 T. Okugi IDT WG2 DR/BDS/DUMP group meeting

Simple WBS in Pre-Lab period (to write the ILC EDR)



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Beam Delivery System

- List up all items for EDR related to BDS
- Picked up the WP related items from the to-do-list of both area and technical systems and categorized.

BDS area system

- 2WPs
- MDI related items
- Remaining items
 of original area systems

Technical system

- Remaining items of original technical systems
- To be integrated the item of each technical category for all area systems

	Items	Deliverables	Related area and technical systems	T
Work packages	Correction of higher order optics aberration (WP-15)	Performance specification	BDS(WP-15)	
	Beam tuning study with machine learning technique (WP-15)	Performance specification	BDS(WP-15)	
	ATF3 beam test (WP-15) Short range static wakefield effect (WP-15)	Performance specification Performance specification	BDS(WP-15) BDS(WP-15)	
WP-15	Short range dynamic wakefield effect (WP-15)	Performance specification	BDS(WP-15)	Re
VVP-15	System desing of the intra-train orbit FB (WP-15)	Performance specification	BDS(WP-15)	
	Cavity BPMs (WP-15)	Performance specification; Costing	BDS(WP-15)/Instrumentation	0
	IP intra-train FB (WP-15)	Performance specification; Costing Performance specification; Costing	BDS(WP-15)/instrumentation BDS(WP-15)/instrumentation	I I V
WP-16	Wakefield minimization for vacuum components (WP-15)	System design; Performance specification; Costing	BDS(WP-15)/Vacuum	lln
	QDO SC magnet and cryostat package (WP-16)	Component design; Costing; Power estimation	BDS(WP-16)/SCmagnet/MDI	p
	Service cryostat,a and He transfer to FD package (WP-16)	Component design; Costing; Power estimation	BDS(WP-16)/SCmagnet/MDI	
	QD0 vibration test (WP-16)	Performance specification Performance specification; Costing	BDS(WP-16)/SCmagnet/MDI	
	Polarimeters Energy spectrometers	Performance specification; Costing Performance specification; Costing	BDS(MDI)/Instrumentation/ADI/MDI BDS(MDI)/Instrumentation/ADI/MDI	
MDI	Anti-DID (detector solenoid)	Component design	BDS(MDI)/Scmagnet/MDI	
	System design of push-pull scheme	System design	BDS(MDI)/CFS/ADI/MDI	
	System design of Packman	System design	BDS(MDI)/CFS/ADI/MDI	
	Items	Deliverables	Related area and technical systems	
	Optics design of final focus beam line (for WP-15)	Beam optics design	BDS	
Area system	Optics design for QD0 package design (for WP-16)	Beam optics design	BDS/SC magnet/MDI	
	Optics design for QF1 package design (for WP-16) Optics design for Crab cavity (for WP-3)	Beam optics design Beam optics design	BDS/SC magnet/MDI BDS/SCRF/MDI/ADI	
	Optics design of crab cavity (for wP-3) Optics design of beam diagnostic system	Beam optics design	BDS/SCRF/MDI/ADI	
Ontice design and	Optics design of beam collimation system	Beam optics design	BDS	
Optics design and	Optics design of mail beam dump line	Beam optics design	BDS	
	Optics design of tuning beam dump line	Beam optics design	BDS	
system integration	System design of the beam diagnostics	System design	BDS .	
system integration	System design of Muon collimation ILC lattice integration	System design Beam optics design	BDS/MDI/ADI ADI/BDS	
	Contact part with ADI for the beam optics issues	Beam optics design	BDS/ADI	
	Integration of the hardware components in DR	Component counts; Costing; Power, cooling water estimation	BDS/TechnicalSystems	
Deeme dura sustan	System design of emergency abort	System design	ADI/BeamDump/CFS/BDS	
Beam dynamics	L* and crossing angle	System design	ADI/CFS/MDI/BDS	
	Correction of higher order optics aberration (WP-15)	Performance specification	BDS(WP-15)	
and tuning	Tolerance evaluation for each device	Performance specification	BDS(WP-15) BDS	
anu tuning	Effect of the ground motion	Performance specification	BDS	
	Long range static wakefield effect (resisitive wall)	Performance specification	BDS	
	Vacuum chamber diameter and magnet bore design	Performance specification	BDS	
	ATF3 beam test (WP-15) Short representatio websfield effect (WD-15)	Performance specification	BDS(WP-15)	
	Short range static wakefield effect (WP-15)	Performance specification	BDS(WP-15) BDS(WP-15)	
	System desing of the intra-train orbit FB (WP-15)	Performance specification	BDS(WP-15)	
	Collimation and detector background evaluation (incl. Muon)	Performance specification	BDS/MDI/ADI	
	Radiation loss evaluation in dump line	Performance specification; System design	BDS/ADI/CFS	
	S2E simulation (BDS part) Contact part with ADI for the beam dynamics and tuning	Performance specification; System design Performance specification	ADI/BDS ADI/BDS	
	Items	Deliverables	Related area and technical systems	
	Cavity BPMs (MP-15)	Performance specification: Costing	RDS/WP.15)/instrumentation	
	IP Intra-train EB (WP-15)	Performance specification: Costing	BDS(WP-15)/instrumentation	
	Upstream Intra-train FB (WP-15)	Performance specification; Costing	BDS(WP-15)/Instrumentation	
The state of the s	Beam current monitor	Costing	Instrumentation/BDS	0
Technical system	Beam size/profile monitors (laserwire)	Performance specification; Costing	Instrumentation/BDS	
	Polarimeters	Performance specification; Costing	BDS(MDI)/Instrumentation/ADI/MDI	
Instrumentation	Laser station for polarimeters and laser wire monitors	System design; Costing; Power, cooling water estimation	Instrumentation/CFS/BDS/MDI	
instrumentation	Cabling and monitor station	Component counts; Costing; Power, cooling water estimation	Instrumentation/CFS/BDS	
	Crab cavities, cryostat (WP-3)	Component design: Costing; Power estimation	SCRF(WP-3)/BDS	
	Crab cavities, cryostat (WP-3) Crab cavity LLRF (WP-3)	Component design; Costing; Power estimation System design; Costing;	SCRF(WP-3)/BDS SCRF(WP-3)/LLRF/BDS	
	Crab cavities, cryostat (WP-3) Crab cavity LLRF (WP-3) He transfer for crab cavity	Component design: Costing: Power estimation System design: Costing: System design: Costing: Component design: Costing: Power, cooling water estimation	SCRF(WP-3)/BDS SCRF(WP-3)/LLRF/BDS SCRF(WP-37)/BDS	
	Crab cavities, cryostat (WP-3) Crab cavity LLRF (WP-3)	Component design: Costing: Power estimation System design: Costing: Costing: Component design: Costing: Power, cooling water estimation Component design: Costing: Power estimation	SCRF(WP-3)/BDS SCRF(WP-3)/LLRF/BDS	
Magnet	Crab cavities, cryostat (WP-3) Crab cavity LLRF (WP-3) He transfer for crab cavity	Eoropeent design: Costing: Power estimation System design: Costing: System design: Costing: Component design: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation	SCRF(WP-3)/BDS SCRF(WP-3)/LLRF/BDS SCRF(WP-37)/BDS	
Magnet	Craft convil LTP: VIP-30 Craft convil LTP: VIP-30 He transfer for craft conto convly IPF source, www.egade.vc. cost convily CDO 5C magnet: and crystat pick-base (VIP-16) Service crystatt, and He transfer to FD package (VIP-16) ODO where VIP-16) ODO where VIP-160	Component design: Costing: Power, cooling water estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Performance specification	SCHF VVF-37/R05 SCHF VVF-37/R05 SCHF VVF-37/R05 HLHF/SCHF VVF-37/R05 DDSVHF-10/SCHapper/AD3	
Magnet	Craft onvites, cryostat (VP-3) Craft onvites (JR (VIP-3) He transfer for crab cavity RF source, waveguide for crab avity (2005 SC mayes and cryostat acchare (VIP-16) Constant and the transfer to FD package (VIP-16) COD whome test (VIP-16) COD whome test (VIP-16) CFI SC magnet and cryostat package	Component design; Costing; Power, cooling water estimation Component design; Costing; Power estimation Component design; Costing; Power estimation Performance specification Component design; Costing; Power estimation	SCRF VWP-3/ R03 SCRF VWP-3/ 186/ R05 SCRF VWP-37) / 80/ R05 HLRF / SCRF VWP-33/ 805 D05/WP-18/ / SCreagent //MD1 ID5/WP-18/ / SCreagent //MD1 ID5/WP-18/ / SCreagent //MD1 SCRaagent //MD8 SCRaagent //MD85	
Magnet	Craft convibus, crystate (VP-3) Craft convibus, PR (VP-3) He transfer for craft convib RF source, waveguide for craft convib (200 Sc mignet and crystate package (VP-16) Environ crystate, and He transfer for PD package (VP-16) Clow vibraties (VP-16) Clow vibraties (VP-16) Clow vibraties (VP-16) Clow vibraties (VP-16) Clow vibraties (VP-16) Clow vibraties (VP-16) He transfer (Inc from crystepic) to service crystat)	Component design: Costing: Power, cooling water estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Performance specification Component design: Costing: Power estimation Component design: Costing: Power estimation	Scher virk-aurikas	
	Craft onvites, cryostat (VP-3) Craft onvites (JR (VIP-3) He transfer for crab cavity RF source, waveguide for crab avity (2005 SC mayes and cryostat acchare (VIP-16) Constant and the transfer to FD package (VIP-16) COD whome test (VIP-16) COD whome test (VIP-16) CFI SC magnet and cryostat package	Component design; Costing; Power, cooling water estimation Component design; Costing; Power estimation Component design; Costing; Power estimation Performance specification Component design; Costing; Power estimation	SCRF VWP-3/ R03 SCRF VWP-3/ 186/ R05 SCRF VWP-37) / 80/ R05 HLRF / SCRF VWP-33/ 805 D05/WP-18/ / SCreagent //MD1 ID5/WP-18/ / SCreagent //MD1 ID5/WP-18/ / SCreagent //MD1 SCRaagent //MD8 SCRaagent //MD85	
	Craft convites. cryostat (VP-3) Craft convit LIR VIP-3) He transfer for craft conb convty RF source, wavegalde for craft conb convty (DOI 5C magnet and cryostat package (VP-16) ODI 5C magnet and cryostat package (VP-16) ODI 5C magnet and cryostat package (VP-16) ODI 5C magnet and cryostat package He transfer line (from cryospecies to service cryostat) Power supplies, and cabling for 5C magnet Anti-DD (detector solensie) NC magnets	Component design: Costing: Power, cooling water estimation Component design: Costing: Power estimation Parlamanes accollations Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation	Scher virk-aurikas	
Magnet RF	Craft circle LTP (MP-3) Craft circle LTP (MP-3) Craft circle LTP (MP-3) BF source, waveguide for craft cards CIO 55 magnet and craftstaf pankage (MP-16) CIO 55 magnet and craftstaf pankage (MP-16) CIO 64 magnet and (MP-16) CIO 64 magnet and (MP-16) CIO 64 magnet (Component design: Costing: Power, cosling water estimation Component design: Costing: Power estimation Performance specification Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cosling water estimation Costing: Power, cosling water estimation Component design:	Coll 9/W-3/10/S Coll 9/W-3/10/S Coll 9/W-30/10/S Coll 9/W-30/W-30/S Coll 9/W-30/W-30/S Coll 9/W-30/W-30/S Coll 9/W-30/W-30/S Coll 9/W-30/W-30/W-30/W-30/W-30/W-30/W-30/W-30	
-	Craft convita. crystat. 00P-30 Craft. convit LLR 7 00P-30 He transfer for crab convity DOD 5C magnet: and crystat parkage. (VIP-16) Enrolice crystata. and He transfer to FD package. (VIP-16) ODD with role and (VIP-16) ODD with role in (VIP-16) ODD starting in (VIP-16) He transfer line (VIP-16) He transfer line (Tom crystepics to service crystata) He transfer line (Tom crystepics to service crystata) Power supplies, and cabling for SC magnet Michael (VIP-16) Nachael (VIP-16)	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Porformance apportion Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Component courts; Costing: Power, costing water estimation	CRF VM-3/R03 COMP-3/R03 COMPARED	
-	Craft convites. cryostat (VP-3) Craft convit LIR VIP-3) He transfer for craft conb convty RF source, wavegalde for craft conb convty (DOI 5C magnet and cryostat package (VP-16) ODI 5C magnet and cryostat package (VP-16) ODI 5C magnet and cryostat package (VP-16) ODI 5C magnet and cryostat package He transfer line (from cryospecies to service cryostat) Power supplies, and cabling for 5C magnet Anti-DD (detector solensie) NC magnets	Component design: Costing: Power, cooling water estimation Component design: Costing: Power estimation Parlamanes accollations Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation	Coll 74/9-37/803 Coll 74/9-37/805 Coll 74/9-37/805 ILDF/SCRFWP-37/805 ILDF/SCRFWP-37/805 DDSWP-16/SCRegeet/MDF DDSWP-16/SCRegeet/MDF DDSWP-16/SCRegeet/MDF DDSWP-16/SCRegeet/MDF DSWP-16/SCRegeet/MDF DSWP DSWP-16/SCRegeet/MDF DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DSWP DS	
RF	Craft civit LBR VIP-30 Craft civit LBR VIP-30 He transfer for craft civity GPO 5C magnet and crystalt package (VIP-16) CPO 5C magnet and crystalt package (VIP-16) CPO 5C magnet and crystalt package (VIP-16) CPO 5C magnet and crystalt package (FL 5C magnet and crystalt package He transfer line (from crystellists to service crystalt) Power supplies, and cabling for SC magnet Extri-DIO forective redension NC magnets Power supplies, and cabling for NC magnet Wachatter Interplayments (pipe, bellows, pump etc.)	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Porformance apportion Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Component courts; Costing: Power, costing water estimation	CRF VM-3/R03 COMP-3/R03 COMPARED	
RF	Carla control and CMP-30 Carla control LBR (VMP-30 Carla control LBR (VMP-30 Extra control LBR (VMP-30 Carla control LBR (VMP-16) COO Strands or constant package (VMP-16) COO Strands or constant package (VMP-16) COO Strands or CMP-16) COO Strands or CMP-16 COO Strands or CMP-16	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Performance apportantiation Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Component counts: Costing: Power, cooling water estimation Component counts: Costing: Power, costing water estimation Component counts: Costing: Power, costing water estimation Component counts: Costing Power, costing water estimation	Colf 20/04-20/055 Colf 20/04-20/055 Colf 20/04-20/055 Colf 20/04-20/055 Colf 20/04-20/055 Colf 20/04-20/05 Colf 20/04-20/04-20/04 Colf 20/04-20/04-20/04 Colf 20/04-20/04-20/04 Colf 20/04-20/04-20/04 Colf 20/04-20/04-20/04-20/04 Colf 20/04-20/04-20/04 Colf 20/04-20/	
-	Carlo civities, crystatic (WP-3) Conta civity, LEN (WP-3) Exatorier, for carb, civity BF source, www.guide for carba civity CDD SC magnets and crossist package (WP-16) CDD SC magnets and the transfer for B package (WP-16) CDD subvariants and the transfer for B package (WP-15) CDD subvariants (spoller, absorber) MPS collimators MUsin spoller and muon wall	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Parlomance specification: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Component design: Costing: Power, cooling water estimation Component counts; Costing: Power, costing System design: Performance specification; Costing System design: Performance specification; Costing Component design: Performance specification; Costing System design; Performance specification; Costing System design; Performance specification; Costing	SCHE VVH-20/1005 SCHE VVH-20/1005 SCHE VVH-30/1005 SCHE VVH-30/1005 SCHE VVH-30/1005 SCHE VVH-30/1005 SCHeagenet VM01	
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RF	Calc anithes, crystate (UPP-3) Conta anity LLPS (UPP-3) Extransfer for calc anxity BF source, wavguide for calca anity CDD SC magnets and croatest package (UPP-16) CDD SC magnets and croatest package (UPP-16) CDD subvariations and the transfer for D package (UPP-15) CDD subvariations and the resource components (UPP-15) Clacuum components (Lippe - balance, supports -1) BDS Collimator (spoller, absorber) MPS pollimators	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Parlomance specification: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Component design: Costing: Power, cooling water estimation Component counts; Costing: Power, costing System design: Performance specification; Costing System design: Performance specification; Costing Component design: Performance specification; Costing System design; Performance specification; Costing System design; Performance specification; Costing	SCHE VVH-20/1005 SCHE VVH-20/1005 SCHE VVH-30/1005 SCHE VVH-30/1005 SCHE VVH-30/1005 SCHE VVH-30/1005 SCHeagenet VM01	
RF	Card cavits, crystat 00P-30 Card cavits, DEP (MP-3) Extransfer for crab cavity BF source, wavegulde for crab cavity (200 Sc magnet and crystat package (MP-16) Cavit and the crastist package (MP-16) Cavit and the crystat package (MP-16) Cavit and the Crim crystat package (MP-16) Cavit and the Crim crystat package (MP-16) Cavit and Cavit and Cavit and Cavit Power supples, and cabling for SC magnet Power s	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Performance assign: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation System design: Performance specification: Costing Component design: Costing: Costing water estimation Component design: Costing: Costing: Costing Component design: Costing: Costing: Costing: Costing Component design: Costing: Costing: Costing: Costing Component design: Costing: Costing: Costing: Costing: Costing Component design: Costing:	Colf 2004-201005 Colf 2004-201005 Colf 2004-201007 Colf 2004-201007 Colf 2004-201007 Colf 2004-2010	
RF	Card cavits, crystat, 07P-30 Card cavits, 14P, 07P-30 Card cavits, 14P, 07P-30 Er source, wavegulde for carda cavity (200 Sc imagent and crystat package (VIP-16) Cavits or crystata, and the transfer for PD package (VIP-16) Cavitation crystata, and the transfer for PD package (VIP-16) Cavitation crystata, or cavits, cavitata, cavits,	Component design: Costing: Power, cooling water estimation Component design: Costing: Power estimation Performance assign: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling: water estimation Component counts: Costing: Power, cooling water estimation Component counts: Costing System design: Performance specification: Costing System design: Performance specification: Costing Component design: Costing: Costing: Costing: Costing Component design: Costing: Costin	Colf 2014-201005 Colf 2014-201005 Colf 2014-2010, 2010, 2010 Colf 2014-2010, 2010, 2010 Colf 2014 Colf 2014-2010, 2010,	
RF	Carla civities, crystate, UVP-30 Conta civities, LEN (WP-30 Conta civities, LEN (WP-30 BF source, weighted for carba civity CDD 95C magnets and ensate transformation CDD 95C magnets and ensate transformation CDD 95C magnets and ensate the D package (WP-30 CDD 95C magnets) CDD 95C magnets and existing and the D package (WP-30 CDD 95C magnets) BF 95C magnets Fouries supplies, and cabling for SC magnet CDD 95C magnets Fouries supplies, and cabling for NC magnet Fouries components (glips, babone, supplies) BDS Collimators Mution spoler and muton wall Basen average for during, cabling and PS Turking beam during Magnet support.	Component design: Costing: Power cosing water estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power costing: Power estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Component courts: Costing: Power, cooling water estimation Component courts: Costing Component courts: Costing Component design: Costing: Costing Component design: Costing: Cooling water estimation Component design: Costing: Costing: Costing Costing Component design: Costing: Costing: Costing Costing Component design: Costing: Costing: Costing Costing Component design: Costing: Costing: Costing: Costing Component design: Costing: C	SCH2 VVH-20/B0S SCH2 VVH-20/B0S SCH2 VVH-20/L0S S	
RF	Carla cavitas, cryestat (WP-3) Conta cavita (LRP (WP-3) Conta cavita (LRP (WP-3) BF source, wavguede for carls and BF source, wavguede for carls and COS SC magnet and creates peakage (WP-16) Cost of the carls of the source of SC package (WP-16) Cost of the carls of the Cost of the Cost (PF SC magnet and cryestat package (WP-16) Cost of the Cost of the Cost of the Cost (PF SC magnet and Cost of the Cost (PF SC Cost (PF SC Cost of the Cost (PF SC Cost (PF S	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Performance assign: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Component costs: Costing System design: Performance specification; Costing System design: Costing: Costing: Costing Component design: Costing: Costing Component design: Costing: Costing Component design: Costing: Costing Component design: Costing: Costing water estimation Component design: Costing: Costing: Costing water estimation Component design: Costing: Costing: Water estimation Component design: Costing: Costing: Water estimation Component design: Costing: Costing: Water estimation System design: Costing: Costing: Costing: System design: Costing: C	SCHE VM-20/205 SCHE VM-20/205 SCHE VM-20/205 SCHE VM-20/205 SCHE VM-20/205 SCHE VM-20/205 SCHE VM-20/205 SCHE VM-20/205 SCHE VM/205 SCHE VM	
RF	Carla cavita, crystat, 079-30 Conta cavita, 1247-079-30 Conta cavita, 1247-079-30 He transfer for carb cavity 000 90 magnet and croatest and active conta cavita, 1247-1249-1249 Conta cavita, 1247-1249-1249 Conta cavita, 1247-1249-1249 Conta cavita, 1247-1249 He transfer line (f. from crystenics to sensice crystat) Power supplets, and cabling for SC magnet Line DD Selectors and extra cavita, 1249 Power supplets, and cabling for SC magnet Contact cavita, 1249-1249 Normal cavita, 1249-1249 Power supplets, and cabling for SC magnet Contact cavita, 1249-1249 Power supplet and monon wall Beam severger for during, cabling and PS Turking beam during Main beam during Main beam during Main beam during Maint for two beamlines around detector area Magnet support Chamber support	Component design: Costing: Power costing water estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Costing: Power, cooling water estimation Component courts: Costing: Power, cooling water estimation Component courts: Costing System design: Performance specification: Costing Component design: Costing: Power, cooling water estimation Component design: Costing costing Component design: Costing cover, cooling water estimation Component design: Costing Costing System design: Costing Costing water estimation Component design: Costing Costing water estimation Component design: Costing Costing water estimation System design: Costing Power, cooling water estimation System design: System design: Costing System design: System design: Costing Sy	SCH2 VVF-32/R0S S	
RF	Craft cavity LEN (WP-3) Craft cavity LEN (WP-3) Extra fer for craft cavity BF source, wavguide for cavity COO SC magnet and cavity COO SC magnet and cavity for COO SC magnet Lende or mostatic and Me Islander to FD package (WP-16) COO wavefue and COO SC magnet Area and Coo SC magnet and coo SC magnet Lende Coo SC magnet and coo SC magnet Lende Coo SC magnet and coo SC magnet Lende Coo SC magnet and coo SC magnet Dever supples, and cabling for SC magnet Exhibition Cooperating (SC Magnet SC Magnet for Cooperating (SC Magnet State magnets for Sc Magnet State magnets for Cooperating (SC Magnet Sc Magnet for Cooperating (SC Magnet Sc Magnet Alignment for the beamfines around detector area Magnet support Cooperating water system and distribution	Component design: Costing: Power, cosing water estimation Component design: Costing: Power estimation Performance assign: Costing: Power estimation Component design: Costing: Power estimation Component design: Costing: Power estimation Costing: Power, cooling water estimation Component costs: Costing System design: Performance specification; Costing System design: Costing: Costing: Costing Component design: Costing: Costing Component design: Costing: Costing Component design: Costing: Costing Component design: Costing: Costing water estimation Component design: Costing: Costing: Costing water estimation Component design: Costing: Costing: Water estimation Component design: Costing: Costing: Water estimation Component design: Costing: Costing: Water estimation System design: Costing: Costing: Costing: System design: Costing: C	SCH2 (VH-2)/1035 SCH2 (VH-2)/1035 SCH2 (VH-2)/1047 SCH2	
RF	Carla cavita, crystat, 079-30 Conta cavita, 1247-079-30 Conta cavita, 1247-079-30 He transfer for carb cavity 000 90 magnet and croatest and active conta cavita, 1247-1249-1249 Conta cavita, 1247-1249-1249 Conta cavita, 1247-1249-1249 Conta cavita, 1247-1249 He transfer line (f. from crystenics to sensice crystat) Power supplets, and cabling for SC magnet Line DD Selectors and extra cavita, 1249 Power supplets, and cabling for SC magnet Contact cavita, 1249-1249 Normal cavita, 1249-1249 Power supplets, and cabling for SC magnet Contact cavita, 1249-1249 Power supplet and monon wall Beam severger for during, cabling and PS Turking beam during Main beam during Main beam during Main beam during Maint for two beamlines around detector area Magnet support Chamber support	Component design: Costing: Power, cosling water estimation Component design: Costing: Power estimation Component design: Costing: Power, cooling water estimation Component design: Power, cooling water estimation Component design: Power, cooling water estimation Component counts: Costing System design: Performance specification; Costing Component design: Costing: Costing water estimation Component design: Costing: Costing water estimation System design: Performance specification; Costing System design: Costing: Costing water estimation System design: Performance specification; Costing System design: Costing: Costing water estimation System design: Costing: Costing water estimation System design: Costing: Costing System design: Costing: Costing System design: Costing: Costing water estimation System design: Costing: Costing water estimation	SCH2 VVF-32/R0S S	
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Resource of technical preparation

Resource of EDR

WBS of BDS area system in the Pre-Lab period

(A) Workpackage oriented

• Easy to manage the resources in Pre-Lab period.

(B) Work item oriented (all WP items belong to area system)

- Representative of WPs will cover some group leaders in area system.
- Easy to manage the design work in Pre-Lab period.

(A) Workpackage oriented

em cordinator	(Area systems)	Items	Deliverables	Resourc
Group Leader	System design	Optics design of final focus beam line (for WP-15)	Beam optics design	EDR
	System integration	Optics design for QD0 package design (for WP-16)	Beam optics design	EDR
		Optics design for QF1 package design (for WP-16)	Beam optics design	EDR
		Optics design for Crab cavity (for WP-3)	Beam optics design	EDR
		Optics design of beam diagnostic system	Beam optics design	EDR
		Optics design of beam collimation system	Beam optics design	EDR
		Optics design of mail beam dump line	Beam optics design	EDR
		Optics design of tuning beam dump line	Beam optics design	EDR
		System design of the beam diagnostics	System design	EDR
		System design of Muon collimation	System design	EDR
		ILC lattice integration	Beam optics design	EDR
		Integration of the hardware components in DR	Component counts; Costing; Power, cooling water estimation	EDR
		System design of emergency abort	System design	EDR
		L* and crossing angle	System design	EDR
		Contact part with ADI for the beam optics issues	Beam optics design	EDR
Group Leader	Beam dynamics	Tolerance evaluation for each device	Performance specification	EDF
		Effect of the ground motion	Performance specification	EDR
		Long range static wakefield effect (resisitive wall)	Performance specification	EDR
		Vacuum chamber diameter and magnet bore design	Performance specification	EDF
		Collimation and detector background evaluation (incl. Muon)	Performance specification	EDR
		Radiation loss evaluation in dump line	Performance specification; System design	EDR
		S2E simulation (BDS part)	Performance specification; System design	EDR
		Contact part with ADI for the beam dynamics and tuning	Performance specification	EDR
Representative for WP-15	WP-15	Correction of higher order optics aberration (WP-15)	Performance specification	TP-WF
		Beam tuning study with machine learning technique (WP-15)	Performance specification	TP-WF
		ATF3 beam test (WP-15)	Performance specification	TP-WF
		Short range static wakefield effect (WP-15)	Performance specification	TP-WF
		Short range dynamic wakefield effect (WP-15)	Performance specification	TP-WF
		System desing of the intra-train orbit FB (WP-15)	Performance specification	TP-WF
		Cavity BPMs (WP-15)	Performance specification; Costing	TP-WF
		IP intra-train FB (WP-15)	Performance specification; Costing	TP-WF
		Upstream intra-train FB (WP-15)	Performance specification; Costing	TP-WF
		Wakefield minimization for vacuum components (WP-15)	System design; Performance specification; Costing	TP-WF
Representative for WP-16	WP-16	QDO SC magnet and cryostat package (WP-16)	Component design; Costing; Power estimation	TP-WF
		Service cryostat, a and He transfer to FD package (WP-16)	Component design; Costing; Power estimation	TP-WF
		QD0 vibration test (WP-16)	Performance specification	TP-WF
Group Leader	MDI	Polarimeters	Performance specification; Costing	EDF
		Energy spectrometers	Performance specification; Costing	EDR
		Anti-DID (detector solenoid)	Component design	EDR
		System design of push-pull scheme	System design	EDR
		System design of Packman	System design	EDR
	(Technical systems)	Items	Deliverables	Resou
	BDS magnets (Hardware)	QF1 SC magnet and cryostat package	Component design; Costing; Power estimation	EDR
		He transfer line (from cryogenics to service cryostat)	Component design; Costing; Power estimation	EDR
		Power supplies, and cabling for SC magnet	Costing; Power, cooling water estimation	EDR
		NC magnets	Costing; Power, cooling water estimation	EDR
		Power supplies, and cabling for NC magnet	Component counts; Costing; Power, cooling water estimation	EDR
	BDS Dump and collimator	BDS Collimater (spoiler, absorber)	System design; Performance specification; Costing	EDR
	bbe built and connact	MPS collimators	System design: Performance specification: Costing	EDB
		MPS collimators Muon spoiler and muon wall	System design; Performance specification; Costing Component design; Costing; Cooling water estimation	EDR

(B) Work item oriented

Beam Delivery System Area System

em cordinator	(Area systems)	Items	Deliverables	Resource
Group Leader	System design	Optics design of final focus beam line (for WP-15)	Beam optics design	EDR
	Optics design	Optics design for QD0 package design (for WP-16)	Beam optics design	EDR
	System integration	Optics design for QF1 package design (for WP-16)	Beam optics design	EDR
		Optics design for Crab cavity (for WP-3)	Beam optics design	EDR
		Optics design of beam diagnostic system	Beam optics design	EDR
		Optics design of beam collimation system	Beam optics design	EDR
		Optics design of mail beam dump line	Beam optics design	EDR
		Optics design of tuning beam dump line	Beam optics design	EDR
		System design of the beam diagnostics	System design	EDR
		System design of Muon collimation	System design	EDR
		ILC lattice integration	Beam optics design	EDR
		Integration of the hardware components in DR	Component counts; Costing; Power, cooling water estimation	EDR
		System design of emergency abort	System design	EDR
		L* and crossing angle	System design	EDR
		Contact part with ADI for the beam optics issues	Beam optics design	EDR
Group Leader	Beam dynamics	Tolerance evaluation for each device	Performance specification	EDR
		Effect of the ground motion	Performance specification	EDR
	1	Collimation and detector background evaluation (incl. Muon)	Performance specification	EDR
	1	Radiation loss evaluation in dump line	Performance specification; System design	EDR
		S2E simulation (BDS part)	Performance specification; System design	EDR
		Contact part with ADI for the beam dynamics and tuning	Performance specification	EDR
Representative for WP-15	WP-15	Correction of higher order optics aberration (WP-15)	Performance specification	TP-WP
Group Leader	Beam tuning	Beam tuning study with machine learning technique (WP-15)	Performance specification	TP-WP
aroup Leader	Collective effect	ATF3 beam test (WP-15)	Performance specification	TP-WP
	conective effect	Short range static wakefield effect (WP-15)	Performance specification	TP-WP
		Short range dynamic wakefield effect (WP-15)	Performance specification	TP-WP
		System desing of the intra-train orbit FB (WP-15)	Performance specification	TP-WP
		Cavity BPMs (WP-15)	Performance specification: Costing	TP-WP1
		IP intra-train FB (WP-15)	Performance specification; Costing	TP-WP1
		Upstream intra-train FB (WP-15)	Performance specification: Costing	TP-WP
		Wakefield minimization for vacuum components (WP-15)	System design; Performance specification; Costing	TP-WP1
		Long range static wakefield effect (resisitive wall)	Performance specification	EDR
		Vacuum chamber diameter and magnet bore design	Performance specification	EDR
Representative for WP-16	WP-16	QDO SC magnet and cryostat package (WP-16)	Component design; Costing; Power estimation	TP-WP
Group Leader	Final Focus Magnets	Service cryostat, a and He transfer to FD package (WP-16)	Component design; Costing; Power estimation	TP-WP
Cloup Leader	Final Focus Magnets	OD0 vibration test (WP-16)	Performance specification	TP-WP
		OF1 SC magnet and cryostat package	Component design; Costing; Power estimation	EDR
		He transfer line (from cryogenics to service cryostat)	Component design; Costing; Power estimation	EDR
		Power supplies, and cabling for SC magnet	Costing: Power, cooling water estimation	EDR
Group Leader	MDI	Polarimeters	Performance specification; Costing	EDR
Group Leader		Energy spectrometers	Performance specification; Costing	EDR
	1	Energy spectrometers Anti-DID (detector solenoid)	Component design	EDR
	1	System design of push-pull scheme	System design	EDR
	1	System design of Packman	System design	EDR
	(Technical sustaine)		Deliverables	
	(Technical systems)	Items		Resour
	BDS magnets (Hardware)	NC magnets	Costing; Power, cooling water estimation	EDR
	DDC Duran and a different	Power supplies, and cabling for NC magnet BDS Collimater (spoiler, absorber)	Component counts; Costing; Power, cooling water estimation	EDR
	BDS Dump and collimator		System design; Performance specification; Costing	EDR
		MPS collimators	System design; Performance specification; Costing	EDR
		Muon spoiler and muon wall	Component design; Costing; Cooling water estimation	EDR
		Beam sweeper for dump, cabling and PS	Component design; Costing; Power, cooling water estimation	EDR

Should BDS collimator and Muon spoiler be managed by dump group ??

Next group meeting

Date and time : June 9^{th} (WED) 22:00 JST

Continuous discussion of WBS in Pre-Lab period.

- Are there any other items that should be included in the to-do-list?
- What items in the list would be more efficient to handle in the same group as WP?

WBS of the BDS area system.

≻ From WP-16 (Brett)

WBS of the DR area system.

- From LBNL (Robert Ryne, Jean-Luc Vay)
- ➢ From optics design and beam dynamics (UK?)
- From corrective effect (Mikhail)

WBS of DR area system in the Pre-Lab period

(A) Workpackage oriented

Easy to manage the resources in Pre-Lab period.

(B) Work item oriented (all WP items belong to area system)

- Some items in are/technical systems are moved to the WP groups. (Works for SC wiggler/cryostat/PS are in same group.)
- Representative of WPs will cover some group leaders in area system.
- Easy to manage the design work in Pre-Lab period.

(C) Work item oriented (some WP items will do technical system)

- All of magnet design will be done in the technical system, not area system.
- The resource of WP-12 will be managed by area system, and divided to magnet group in the technical system.
- Easy to manage the design work of the technical system.

(B) Work item oriented (all WP items belong to area system)

Damping Ring Area System

em cordinator	(Area systems)	Items	Deliverables	Resource
Group Leader	System design	System design of the beam diagnostics	Beam optics design	EDR
	Beam tuning	ILC lattice integration	Beam optics design	EDR
	System integration	Small emittance tuning	Performance specification	EDR
	, ,	Tolerance evaluation for each device	Performance specification	EDR
		System design of emergency abort	System design	EDR
		Integration of the hardware components in DR	Component counts; costing; power, cooling water estimation	EDR
		Contact part with ADI for the beam optics issues	Beam optics design	EDR
		Contact part with ADI for the beam dynamics and tuning	Performance specification	EDR
Representative for WP-12	WP-12	DR cell design, based on present ILC optics (WP-12)	Beam optics design	TP-WP1
Group Leader	Optics design	DR cell design (further small emittancs) (WP-12)	Beam optics design	TP-WP1
-	DR magnets (Hardware)	DR straight section optics design (for WP-14)	Beam optics design	EDR
		Dynamic aperture survey (WP-12)	Beam optics design; Performance specification	TP-WP1
		SC wiggler magnets (WP-12)	Component design; costing; power, cooling water	TP-WP1
		Cryostat, He transfer	Component design; costing	EDR
		Power supplies, and cabling for SC magnet	Component counts; costing; power, cooling water estimation	EDR
		Design of PM (WP-12)	Component design; costing; power, cooling water	TP-WP1
		PM prototyping (WP-12)	Performance specification	TP-WP1
		NC magnets (WP-12)	Component design; costing; power, cooling water	TP-WP1
		Power supplies, and cabling for NC magnet	Component counts; costing; power, cooling water estimation	EDR
		Magnet support	System design; costing	EDR
Representative for WP-13	WP-13	Ion trapping and fast ion instability (WP-13)	Performance specification	TP-WP1
Group Leader	Beam dynamics	Electron cloud instability (WP-13)	Performance specification	TP-WP:
		Fast FB system design (WP-13)	System design; costing	TP-WP1
		Fast FB test (WP-13)	Performance specification	TP-WP1
		Vacuum chambers to reduce SEY for positrin DR (WP-13)	Performance specification	TP-WP1
		Spece charge effects	Performance specification	EDR
		Impedance driven instability	Performance specification	EDR
		Tune shift by quadrupole wake for E-driven PS	Performance specification	EDR
Representative for WP-14	WP-14	System design of fast injection/extraction system (WP-14)	System design;	TP-WP1
		Fast kicker devices (WP-14)	Component design; costing;	TP-WP1
		Fast kicker power supplies (WP-14)	Component design; costing; power, cooling water estimation	TP-WP1
	1	System design of injection kicker for E-driven PS (WP-14)	System design;	TP-WP1
	1	Injection kicker device for E-driven PS (WP-14)	Component design; costing;	TP-WP1
		Injection kicker power supplies for E-driven PS (WP-14)	Component design; costing; power, cooling water estimation	TP-WP1
•	(Technical systems)	Items	Deliverables	Resour

(A) Workpackage oriented

Damping Rings System cordinator (Area s

tem cordinator (Area systems)		Items	Deliverables	Resource
Group Leader	Optics design	DR straight section optics design (for WP-14)	Beam optics design	EDR
	System design	System design of the beam diagnostics	Beam optics design	EDR
	Beam dynamics	ILC lattice integration	Beam optics design	EDR
	Beam tuning	Small emittance tuning	Performance specification	EDR
	System integration	Tolerance evaluation for each device	Performance specification	EDR
		Spece charge effects	Performance specification	EDR
		Impedance driven instability	Performance specification	EDR
		Tune shift by quadrupole wake for E-driven PS	Performance specification	EDR
		Integration of the hardware components in DR	Component counts; costing; power, cooling water estimation	EDR
		Contact part with ADI for the beam optics issues	Beam optics design	EDR
		Contact part with ADI for the beam dynamics and tuning	Performance specification	EDR
Representative for WP-12	WP-12	DR cell design, based on present ILC optics (WP-12)	Beam optics design	TP-WP12
	1	DR cell design (further small emittancs) (WP-12)	Beam optics design	TP-WP12
		Dynamic aperture survey (WP-12)	Beam optics design; Performance specification	TP-WP12
		SC wiggler magnets (WP-12)	Component design; costing; power, cooling water	TP-WP12
		Design of PM (WP-12)	Component design; costing; power, cooling water	TP-WP12
		PM prototyping (WP-12)	Performance specification	TP-WP12
		NC magnets (WP-12)	Component design; costing; power, cooling water	TP-WP12
Representative for WP-13	WP-13	Ion trapping and fast ion instability (WP-13)	Performance specification	TP-WP13
-		Electron cloud instability (WP-13)	Performance specification	TP-WP1
		Fast FB system design (WP-13)	System design; costing	TP-WP13
		Fast FB test (WP-13)	Performance specification	TP-WP13
		Vacuum chambers to reduce SEY for positrin DR (WP-13)	Performance specification	TP-WP13
Representative for WP-14	WP-14	System design of fast injection/extraction system (WP-14)	System design;	TP-WP14
	1	Fast kicker devices (WP-14)	Component design; costing;	TP-WP14
		Fast kicker power supplies (WP-14)	Component design; costing; power, cooling water estimation	TP-WP14
		System design of injection kicker for E-driven PS (WP-14)	System design;	TP-WP14
		Injection kicker device for E-driven PS (WP-14)	Component design; costing;	TP-WP14
		Injection kicker power supplies for E-driven PS (WP-14)	Component design; costing; power, cooling water estimation	TP-WP14
	(Technical systems)	Items	Deliverables	Resourc
	DR magnets (Hardware)	Cryostat, He transfer	Component design; costing	EDR
		Power supplies, and cabling for SC magnet	Component counts; costing; power, cooling water estimation	EDR
		Power supplies, and cabling for NC magnet	Component counts; costing; power, cooling water estimation	EDR
		Magnet support	System design; costing	EDR

(C) Work item oriented (some WP items in technical system)

Damping Ring Area System

em cordinator	(Area systems)	Items	Deliverables	Resource
Group Leader	System design	System design of the beam diagnostics	Beam optics design	EDR
	Beam tuning	ILC lattice integration	Beam optics design	EDR
	System integration	Small emittance tuning	Performance specification	EDR
	-,	Tolerance evaluation for each device	Performance specification	EDR
		System design of emergency abort	System design	EDR
		Integration of the hardware components in DR	Component counts; costing; power, cooling water estimation	EDR
		Contact part with ADI for the beam optics issues	Beam optics design	EDR
		Contact part with ADI for the beam dynamics and tuning	Performance specification	EDR
Representative for WP-12	WP-12	DR cell design, based on present ILC optics (WP-12)	Beam optics design	TP-WP12
Group Leader	Optics design	DR cell design (further small emittancs) (WP-12)	Beam optics design	TP-WP12
	DR magnets (Hardware)	DR straight section optics design (for WP-14)	Beam optics design	EDR
	.	Dynamic aperture survey (WP-12)	Beam optics design; Performance specification	TP-WP12
Representative for WP-13	WP-13	Ion trapping and fast ion instability (WP-13)	Performance specification	TP-WP13
Group Leader	Beam dynamics	Electron cloud instability (WP-13)	Performance specification	TP-WP13
		Fast FB system design (WP-13)	System design; costing	TP-WP13
		Fast FB test (WP-13)	Performance specification	TP-WP13
		Vacuum chambers to reduce SEY for positrin DR (WP-13)	Performance specification	TP-WP13
		Spece charge effects	Performance specification	EDR
		Impedance driven instability	Performance specification	EDR
		Tune shift by quadrupole wake for E-driven PS	Performance specification	EDR
Representative for WP-14	WP-14	System design of fast injection/extraction system (WP-14)	System design;	TP-WP14
		Fast kicker devices (WP-14)	Component design; costing;	TP-WP14
		Fast kicker power supplies (WP-14)	Component design; costing; power, cooling water estimation	TP-WP14
		System design of injection kicker for E-driven PS (WP-14)	System design;	TP-WP14
		Injection kicker device for E-driven PS (WP-14)	Component design; costing;	TP-WP14
		Injection kicker power supplies for E-driven PS (WP-14)	Component design; costing; power, cooling water estimation	TP-WP14
	(Technical systems)	Items	Deliverables	Resource
	DR magnets (Hardware)	SC wiggler magnets (WP-12)	Component design; costing; power, cooling water	TP-WP12
		Cryostat, He transfer	Component design; costing	EDR
		Power supplies, and cabling for SC magnet	Component counts; costing; power, cooling water estimation	EDR
		Design of PM (WP-12)	Component design; costing; power, cooling water	TP-WP12
		PM prototyping (WP-12)	Performance specification	TP-WP12
		NC magnets (WP-12)	Component design; costing; power, cooling water	TP-WP12
		Power supplies, and cabling for NC magnet	Component counts; costing; power, cooling water estimation	EDR
		Magnet support	System design; costing	EDR

Part of WP12 resources

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