

LIST OF FORESEEN DEPARTMENTAL REQUESTS (DRs) FOR THE NEXT TWO YEARS

Item	Package Name	Work Package Reference	Detailed Description	Foreseen Cost Range	Foreseen Date for Purchasing Process	Domains Of Activity 1	Domains Of Activity 2 (if any)
1	Q2 Series - Wedges	WP03	Coil wedges produced by extrusion for the Q2 series production	50k<<<200k	Sep-17	Magnets components and assemblies	N/A
2	Q2 Series - Heat exchanger tube	WP03	Heat exchanger tube for the 1st and the 2nd prototype. Orders might be split out for each prototype.	50k<<<200k	May-18	Magnets components and assemblies	N/A
3	Q2 - Strand for series	WP03	Strand for the manufacturing of the Q2 series (2 magnets, PIT wire)	>750k	Mar-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
4	Q2 - Strand for series	WP03	Strand for the manufacturing of the Q2 series (2 magnets, RRP wire)	>750k	Mar-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
5	Q2 - Strand for series	WP03	Strand for the manufacturing of the Q2 series (6 magnets, RRP or PIT wire, not yet decided)	>750k	Dec-17	Magnets components and assemblies	N/A
6	D2-Q4 Corrector series	WP03	A series of 16+4 corrector magnets for Q4 and D2 - Nb-Ti ribbon cable	>750k	Jan-18	Magnets components and assemblies	N/A
7	Nl correctors	WP03	Series of 36 correctors, plus 9 spares, of 5 different type, based on Nb-Ti wire, superferric	>750k	Jan-18	Magnets components and assemblies	N/A
8	MCBFA/B - Single Aperture Corrector Package	WP03	Series of 4+2 long correctors (2.2 m long) plus 8+2 short correctors (1.2 m long) based on Rutherford cable	>750k	Jan-18	Magnets components and assemblies	N/A
9	Q2 Series - Coil production	WP03	Fabrication of 2 coils and assembly in one CERN prototype, fabrication of 40 series coils and assembly of 8 series magnets includes procurement of tooling for assembly and coil manufacturing. Insulated cable, and all coil and structure components provided by CERN	>750k	Aug-16	Magnets components and assemblies	N/A
10	D2&Q2 Tooling - Handling Tooling	WP03 WP11	10 m long universal handling tooling to lift D2 cold dipole, MQXF magnet and cold masses. Load capacity 30 tons	50k<<<200k	Oct-16	Others	N/A
11	Q2 Series - Steel Laminations	WP03 WP11	Fine-blanked low carbon steel laminations that are needed for the cold mass assembly. The MS for the steel laminations of the 11T Dipoles will be also used for the WP3 magnets	>750k	Apr-17	Magnets components and assemblies	N/A
12	Shells for HL-LHC magnets	WP03 WP11	Austenitic steel shells that are needed for the cold mass assembly. The MS for the shells of the 11T dipoles will be also used WP3 magnets	>750k	Feb-17	Magnets components and assemblies	N/A
13	Austenitic stainless steel strips for the HL-LHC superconducting magnets collars	WP03 WP11	Supply of 475 tonnes of austenitic stainless steel strips for the manufacture of collars of the HL-LHC superconducting magnets.	>750k	Feb-17	Raw Materials	
14	Collars for HL-LHC magnets	WP03 WP11	Fine-blanked austenitic steel laminations that are needed for the collaring coils. The MS for the steel laminations of the 11T Dipoles will be also used for the WP3 magnets	>750k	May-17	Magnets components and assemblies	High precision Assembling and manufacturing technologies
15	Q2 - Supporting Structure	WP03	Supply of supporting structures for the inner triplet quadrupole magnets MQXFB including the yoke, load pad and collar structure. CERN intends to place a contract for the supporting structures of the new inner triplet quadrupole magnets MQXFB, including the thick yoke, load-pads and collars. The yoke laminations are 50 mm thick and with outer radius of 278 mm separated in four segments. These yoke thick laminations will be assembled together with yoke thin laminations 5.8 mm thick to form a full length stack of about 7.5 m. The pad laminations are 50 mm thick, 20 mm wide and ~200 mm tall. These pad thick laminations will be assembled together with pad thin laminations 5.8 mm thick to form a full length stack of about 7.5 m. The collars are 50 mm thick lamination with an inner radius of 114 mm and a width of about 20 mm. The geometries require high precision milling and/or EDM machining.	>750k	Feb-17	Magnets components and assemblies	
16	Q2 Series - Parts raw material for supporting structure	WP03	Supply of ARMCO raw material needed for the fabrication of the main supporting components (yoke, loadpads, masters, end-plates) of the new inner triplet MQXFB magnets. CERN intends to place a contract for the raw material needed to machine the shells for the new inner triplet quadrupole magnets MQXFB.	200k<<<750k	Feb-17	Raw Materials	
17	Q2 Series - Raw material for the Al Shells	WP03	Supply of Aluminium raw material for the outer shells of the new inner triplet MQXFB magnets. CERN intends to place a contract for the raw material needed to machine the shells of the new inner triplet quadrupole magnets MQXFB.	200k<<<750k	Feb-17	Magnets components and assemblies	
18	Q2 Series - Machining shell, masters	WP03	Supply of main components (Aluminium shells, master-plates, end-plates) needed for the new inner triplet MQXFB magnets. CERN intends to place a contract for the raw material needed to machine the shells of the new inner triplet quadrupole magnets MQXFB. The aluminium shells, machined from rolled rings have an outer diameter of 614 mm and a length of up to 800 mm. 10 of these yoke shell will be used in each magnet. The master plates are have a length of ~3.7 m (magnet half-length) and a width of 230 mm with a thickness of 15 mm. The end plates are 75 and 50 mm thick, with a square cross-section with a side of about 300 mm.	>750k	Feb-17	Magnets components and assemblies	
19	Cryomodule - Moveable Table	WP04	Supply of a device with a moveable platform, carrying accelerator components with a total mass of about 6 ton. The device will be operated in the SPS accelerator (with presence of radiation), controlled via 300 m long cables. It requires a set of interlocks for SPS operation. The supply must be fully functionally tested at the factory	200k<<<750k	Oct-16	High precision Assembling and manufacturing technologies	Others
20	RF - LRF & Fast Controls	WP04	Faraday cage for Low Level RF racks	50k<<<200k	Feb-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
21	DQW Crab Cavities Pre-series and Series - Supply of Niobium (Nb) and Niobium Titanium (Nb-Ti)	WP04	Raw material required for the Bare Cavities and HOMs manufacturing	>750k	Apr-17	Raw Materials	N/A
22	DQW Crab Cavities Pre-series and Series - Manufacturing of Bare Cavities, He Tanks and assembly of Dressed Cavities	WP04	Full manufacturing of Bare Cavities and Helium Tanks. Assembly of the Dressed Cavities (Bare Cavity+Cold Magnetic Shield produced by others+HOM Couplers & Pick-ups produced by others+He Tank)	>750k	Apr-17	High precision Assembling and manufacturing technologies	N/A
23	DQW Crab Cavities Pre-series and Series - Manufacturing of HOM Couplers & Pick-ups	WP04	Full manufacturing of all variants of High Order Modules (HOMs) and Pick-ups to be installed in the Dressed Cavities	>750k	Jun-17	High precision Assembling and manufacturing technologies	N/A
24	DQW Crab Cavities Pre-series and Series - Manufacturing of Cold Magnetic Shields	WP04	Full manufacturing of the Cold Magnetic Shields to be installed in the Dressed Cavities	200k<<<750k	Jun-17	High precision Assembling and manufacturing technologies	N/A
25	Niobium and Nb-Ti for RFD Cavity	WP04	Material to be used for RFD cavities production. Depending on the quantity at stock, some order may be launched (not confirmed)	50k<<<200k	Apr-17	Raw Materials	N/A
26	RFD Cryomodule Prototype - Vacuum Vessel	WP04	Vacuum vessel for the RFD cryomodule to be tested in SPS within the crab cavities framework	50k<<<200k	Feb-18	Raw Materials	N/A
27	Halo Cleaning - Absorber blocks for TCSPM	WP05	Supply of a minimum of 120 absorber blocks for the HL-LHC collimator jaws. This will involve the production of a novel material based on Molybdenum Carbide - Graphite composite (MoGr), its post-production heat treatments and the machining to the specified geometrical and dimensional requirements.	>750k	Mar-16	Collimators and new material resistant to high temperatures	Raw Materials
28	IR Cleaning - Absorber blocks for TCTPM	WP05	Supply of an estimated quantity of 100 absorber Copper - Diamond composite blocks for HL-LHC collimators. This involves the production of a material based on Copper - Diamond composite, its heat treatments and the machining to the specified geometrical and dimensional requirements.	200k<<<750k	Oct-16	Collimators and new material resistant to high temperatures	Raw Materials
29	Halo Cleaning - Crystal Collimation (TCCP)	WP05	Components crystal collimation ions at IR7	50k<<<200k	Aug-17	Collimators and new material resistant to high temperatures	N/A
30	IR Cleaning - TCSPM (Target Collimator Tertiary Pick-up Metallic), TCTPM (Target Primary Collimator Pick-up Metallic), TCPPM (Target Primary Collimator Pick-up Metallic) DS Collimation - TCLDA (Target Collimator Long Dispersion Suppressor)	WP05	Manufacturing and supply of 24 collimators to be installed during LS2	>750k	Nov-16	Collimators and new material resistant to high temperatures	N/A
31	Prototype - Cabling of superconductors	WP06A	HTS Cables for the triplets	50k<<<200k	Jun-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
32	Prototype - Cable assembly	WP06A	Grouping of sub cables in the final link	50k<<<200k	Aug-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
33	Prototype - Cabling of superconductors	WP06A	HTS Cables for Matching Sections (MSs)	200k<<<750k	Jun-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
34	Prototype - Current Leads for prototype	WP06A	Manufacturing of mechanical components for current leads according to CERN execution drawings: The current leads are needed for i) the SM-18 test stations (16 units rated at 2 kA); ii) a prototype HL-LHC Cold Powering System (4 units rated at 18 kA, 15 units rated at 2 kA and 23 units rated at 0.2 kA); iii) the LHC consolidation project (15 current lead assemblies, each containing four 600 A LHC HTS current leads).	>750k	Oct-16	Electrical Equipment, electronics and instrumentation for accelerators	N/A
35	Series - Cabling of superconductors	WP06A	1000 km superconductor wire for series production	>750k	Jul-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
36	Series - Cabling of superconductors	WP06A	HTS Cables for series production for triplets	>750k	Sep-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
37	Series - Cabling of superconductors	WP06A	MgB2 cable (for the triplets) required for series production	>750k	Sep-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
38	Series - Cabling of superconductors	WP06A	HTS Cable configuration for Matching Sections (MSs) for the series production	>750k	Sep-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
39	Series - Superconducting Link Cryostat	WP06A	100m-long semi flexible cryostats for the Superconducting link of HL-LHC project. Series production	>750k	Feb-18	Cryostats and subcomponents for cryogenic equipment	N/A

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40	Series - DF Cryostat	WP06A	Cryostats for series production	>750k	Sep-17	Cryostats and subcomponents for cryogenic equipment	N/A
41	Series - Cabling of superconductors	WP06A	MgB2 cables configuration for Matching Sections (MS) for series production	>750k	Jul-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
42	Series - DFH Cryostat	WP06A	Cryostats for series production (Matching sections and triplets)	>750k	Sep-17	Cryostats and subcomponents for cryogenic equipment	N/A
43	Measurement&controls - DCCT (Direct Current Transformer)	WP6B	Device for high precision DC measurement	50<<<200k	May-17	Electrical Equipment, electronics and instrumentation for accelerators	
44	CLIQ System	WP07	Coupling-Loss Induced Quench (CLIQ) system to be used as quench detection system for the HL-LHC project	200k<<750k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
45	Mechanical DC Switches	WP07	Mechanical low DC (1.5 kA) switches that belong to the Energy Extraction System of the LHC	200k<<750k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
46	Cold by-pass diodes	WP07	Cold by-pass diodes 13kA and 17kA for the Energy extraction system of the LHC Radiation hardness	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
47	Assembly of Cold Diodes	WP07	Assembly of Cold Diodes to be used within the Energy Extraction System of the LHC. E-Beam welding shall be required	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	High precision Assembling and manufacturing technologies
48	Electronic Boards	WP07	Electronic Boards for the Quench Detection System of the LHC	200k<<750k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
49	Communications and Cabling	WP07	Devices for Communication system and cabling	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
50	di/dt Sensors	WP07	di/dt sensors to be used for the Quench Detection System of the LHC	50k<<<200k	Jan-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
51	VAX relocation prototype - Plug-in connectors	WP08	Plug-in connectors (multiple connection; power, control & pneumatic) for the VAX relocation prototyping works	50k<<<200k	Mar-17	Others	N/A
52	VAX prototype - Support Structure	WP08	Aluminium Support structure, flanges and mobile modules for the prototype of the VAX that need to be relocated.	50k<<<200k	Mar-17	High precision Assembling and manufacturing technologies	N/A
53	TANB - Thermocouples and heaters	WP08	Alignment targets for the TANB	50k<<<200k	Apr-17	Others	N/A
54	TANB - Raw Material - Wolfmet/Densimet/Inermet	WP08	High Density Tungsten alloy, Inermet type, for manufacturing the TANB (Neutral target absorbers for insertion region neutrals) to be built for LHCb	50k<<<200k	Apr-17	Raw Materials	N/A
55	TANB - Raw Material - Iron	WP08	Iron for manufacturing the TANB (Neutral target absorbers for insertion region neutrals) to be built for LHCb	50k<<<200k	Apr-17	Raw Materials	N/A
56	Machining in situ of components	WP08	Machining of metallic structures	50k<<<200k	Mar-18	High precision Assembling and manufacturing technologies	N/A
57	Warm storage for Crab Cavities at SPS	WP09 WP04	Vertical gaseous Helium storage tanks for pressure up to 15 bar. Industrial Standard	50k<<<200k	May-17	Cryogenics systems for HL-LHC	N/A
58	Cryogenic storage for Crab Cavities at SPS	WP09 WP04	Vertical liquid Nitrogen storage tank. Industrial Standard. 1 Unit of about 10000l	50k<<<200k	May-17	Cryogenics systems for HL-LHC	N/A
59	Controls & Instrumentation for Crab Cavities at SPS	WP09	Work done in-house with standardized selected instruments	50k<<<200k	Jun-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
60	Cryogenic valves for helium	WP09	Supply of cryogenic control and On/Off valves for the cryogenic distribution system of the superconducting RF crab cavities test facilities currently under construction at SPS-BA6 and SM18 bunker M7 at CERN.	50k<<<200k	Nov-16	Cryogenics systems for HL-LHC	N/A
61	Vacuum Vessels	WP11	Supply of 4 vacuum vessels for the WP11 bypass cryostats for installation of collimators in the LHC dispersion suppressor regions. Details : The vacuum vessels consist of three large tubes welded to common end flanges of 1055 mm in diameter, resulting in a total length of approximately 1.6 m. Precision machining of interfaces is required in order to ensure proper alignment of the internal components in the LHC particle accelerator. All vacuum vessels are made from austenitic stainless steel. This is a build to print supply according to drawings and specifications provided by CERN.	200k<<750k	Sep-16	Cryostats and subcomponents for cryogenic equipment	High precision Assembling and manufacturing technologies
62	Vacuum Vessels	WP11	Supply of 13 vacuum vessels for the 11T dipole magnets and connection cryostats for installation of collimators in the LHC dispersion suppressor regions during the long shutdown two (LS2). The vacuum vessels are of cylindrical shape, 914 mm in diameter and up to 5.5 m in length. Precision machining of interfaces is required in order to ensure proper alignment of the internal components in the LHC particle accelerator. Up to four design variants are possible. All vacuum vessels are made from low carbon steel specified for low temperature operation down to -50 C and equipped with stainless steel flanges at the extremities. This is a build to print supply according to drawings and specifications provided by CERN.	>750k	Sep-16	Cryostats and subcomponents for cryogenic equipment	High precision Assembling and manufacturing technologies
63	Copper Lyras	WP11	Oxygen-free copper lyras that are needed for the cold mass assembly of the 11T dipole	50k<<<200k	May-17	Magnets components and assemblies	N/A
64	ODS Wedges	WP11	Cold drawn precision profiles (wedges) made of aluminum oxide dispersion strengthened (ODS) copper	50k<<<200k	Apr-17	Magnets components and assemblies	N/A
65	Circuits & cables for Quench protection heaters	WP03 WP11	Supply of quench heaters (QH) for HL-LHC magnets. The QH are large flexible printed circuits that are produced by a photolithographic process. The Cu coated QH base material is provided by CERN. Supply of quench heaters for HL-LHC magnets: 11 T dipole, MQXF short model, MQXF long prototype and series, MQXF, MQXFb, MQXF, MBRD, MCBXFA, MCBXFB, MQ, MQY Fabrication of 8 collared coils of the 11 T dipole for HL-LHC.	>750k	In progress	DR-6674356 MS in progress	Mar-17
66	Assembly works	WP11	Details : - The fabrication of the coils and collared coils shall take place at CERN in the Large Magnet Facility in bldg. 180, using the CERN tooling; - The collared coils shall be conforming to the CERN CAD models and drawings; - The components will be provided by CERN; - The QC shall be part of the supply.	>750k	Oct-16	Others	N/A
67	Coil End Spacers	WP11	Sets of 316L austenitic steel spacers produced by selective laser sintering.	50k<<<200k	Apr-16	Magnets components and assemblies	N/A
68	Heat Exchanger Tubes	WP11	Oxygen-free copper heat-exchanger tubes that are needed for the cold mass assembly of the 11T dipole	50k<<<200k	May-17	Magnets components and assemblies	N/A
69	Removable Poles	WP11	Titanium removable poles which are needed for the collared coil assembly of the 11T dipole	200k<<<750k	May-17	Magnets components and assemblies	N/A
70	Steel Laminations (Yoke plates)	WP11	Fine-blanked low carbon steel laminations that are needed for the cold mass assembly of the 11T dipole. The MS for the steel laminations of the 11T Dipoles will be also used for the WP3 magnets	200k<<<750k	Mar-17	Magnets components and assemblies	N/A
71	End Covers	WP11	Austenitic stainless steel end covers that are needed for the cold mass assembly of the 11T dipole	50k<<<200k	May-17	Magnets components and assemblies	N/A
72	Shells	WP11	Austenitic steel shells that are needed for the cold mass assembly of the 11T dipole. The MS for the shells of the 11T dipoles will be also used WP3 magnets	200k<<<750k	Mar-17	Magnets components and assemblies	N/A
73	Tooling - Impregnation Mould	WP11	Supply of high precision mechanical parts for the assembly of one impregnation moulds for the production of the Nb3Sn coils of the 11 T dipole magnet for the HL-LHC Project. Deliveries are foreseen within 21 weeks after award of the contract.	50k<<<200k	Feb-17	Others	
74	Tooling - Reaction Tool	WP11	High precision mechanical parts for the assembly of one reaction fixture for the heat treatment of the Nb3Sn coils of the 11 T dipole magnet Project. Deliveries are foreseen over 21 weeks from placement of the HL-LHC the contract.	50k<<<200k	Feb-17	Others	
75	Austenitic stainless steel strips for the HL-LHC superconducting magnets collars	WP03 WP11	Supply of 475 tonnes of austenitic stainless steel strips for the manufacture of collars of the HL-LHC superconducting magnets.	>750k	Feb-17	Raw Materials	
76	Cold Bore		Precision machined seamless AISI 316LN stainless steel cold bores from CERN supplied raw material: - 4 for short and long D2 proto's. - 4 for MQXF proto's. - 71 for HL-LHC series cryo-magnets. - Inner diameter ranging from 80 to 139 mm. - Inner diameter tolerance ISO H8. - Wall thickness ranging from 2.6 to 4 mm. - Wall thickness tolerance +0/+0.25 mm. - Unit lengths up to 13.5 m.	>750k	Feb-17	Magnets components and assemblies	
77	Cold Bore - Stainless Steel 316LN	WP12	Around 113 tonnes of forged billets in AISI 316LN ESR grade stainless steel for the production of cold bores for D2 and MQXF prototypes and HL-LHC series cryo-magnets. - Billet diameters 120 and 160 mm. - Unit lengths up to 13.5 m.	>750k	Nov-16	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
78	Raw Material - Tungsten for testing	WP12	Tungsten shielding prototypes for assembly of beam screen tubes for HL-LHC inner triplets, Q1 to D1 beam screens in IR 1&5. 20x Tungsten shields version 16mm in Inermet® (IT180). 20x Tungsten shields version 6mm in Inermet® (IT180). 1x Tungsten bloc for cryogenic test in Inermet® (IT180). MS-4077 (done by Magnets group) will be reused for this tendering	50k<<<200k	Jan-17	Raw Materials	Ultra high vacuum components and systems
79	PIM (Plug-in modules)	WP12	Shielded Bellows expansion joints	200k<<<750k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
80	Beam Screen Facility plus Finishing	WP12	Beam Screen Facility plus Finishing (laser engineered welding machine). Industrial laser machine to be installed in the beam screen facility in SMA18. The laser will be used for the assembly of HL-LHC beam screens from components purchased in industry.	200k<<<750k	Jan-17	Others	N/A

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81	Assembly Bench and insertion tooling	WP12	Assembly Bench and insertion tooling	50k<<200k	Apr-17	Others	N/A
82	Interconnect (Beam vacuum + cooling)	WP12	Flexible 'interconnects' to ensure continuity of vacuum, along with local electrical and (where necessary) cryogenic services	50k<<200k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
83	Titane and Supporting System	WP12	Titane and supporting system for the UHV in the LHC	50k<<200k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
84	Beam Screen Metal Works	WP12	Supply of around 100 beam screen tubes for HL-LHC cryo-magnets from special grade stainless steel strip provided by CERN. Punching, Forming and Welding of UHV Beam Screens for the LHC	>750k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
85	Ion-pump (VPI) controllers	WP12	VPI re-cabling Point 3/Point 7 and new controllers	200k<<750k	Jan-18	Ultra high vacuum components and systems	N/A
86	Cold-warm Transitions	WP12	The CWTs will connect the cryogenic-cooled beam pipes to the room temperature region.	200k<<750k	Dec-17	Ultra high vacuum components and systems	N/A
87	Tooling: Beam Screen Horizontal Coating	WP12	Tooling: Beam Screen Horizontal Coating	200k<<750k	Mar-18	Others	N/A
88	Thermal Link	WP12	Thermal links made of copper to be installed between the tungsten absorbers and the cooling tubes.	50k<<200k	Dec-17	Ultra high vacuum components and systems	High precision Assembling and manufacturing technologies
89	Beak-out System	WP12	Bake-out system for the LHC. Jackets, cables, thermocouples...	50k<<200k	Dec-17	Ultra high vacuum components and systems	N/A
90	Beam diagnostics & instrumentation - BLM (Beam loss monitors)	WP13	Component BLM - CVD diamond detectors for the measurement of particle beams	200k<<750k	Apr-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
91	Beam diagnostics & instrumentation - BPM (Beam position monitors)	WP13	Components for BPM	50k<<200k	Apr-17	Electrical Equipment, electronics and instrumentation for accelerators	N/A
92	Beam diagnostics & instrumentation - BLM (Beam loss monitors)	WP13	System and Cables	200k<<750k	Mar-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
93	Beam diagnostics & instrumentation - BLM (Beam loss monitors)	WP13	Semi-Rigid, Radio Frequency, Coaxial Cables utilizing glass-metal or brazed ceramic sealing technology for use in cryogenic and radiation environments.	200k<<750k	Apr-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
94	Beam diagnostics & instrumentation - BPM (Beam position monitors)	WP13	Radio Frequency UHV feedthroughs utilising glass-metal or brazed ceramic sealing technology for use in cryogenic and radioactive environments.	200k<<750k	May-18	Electrical Equipment, electronics and instrumentation for accelerators	N/A
95	Beam diagnostics & instrumentation - BGV (Beam Gas Vertex Detector)	WP13	Vacuum System	200k<<750k	Jun-18	Ultra high vacuum components and systems	N/A
96	TDIS prototype - Raw Material - Graphite	WP14	Highly purified Graphite that will be used to manufacture Beam Absorbing Blocks.	50k<<200k	Oct-17	Collimators and new material resistant to high temperatures	Raw Materials
97	TDIS prototype - Roller Screw	WP14	Mechanical actuator that requires high precision and rigidity and will be used as a component of the injection system (TDIS)	50k<<200k	Sep-17	Collimators and new material resistant to high temperatures	High precision Assembling and manufacturing technologies
98	TDIS prototype - Vacuum Vessel production (Machining & Welding) of raw materials	WP14	Vacuum vessels to be manufactured for the TDIS prototype (Stainless Steel 304 with flanges in Stainless Steel 316LN). Raw material will be provided by CERN	200k<<750k	Mar-17	High precision Assembling and manufacturing technologies	Collimators and new material resistant to high temperatures
99	TDIS prototype - Aluminium back Stiffener	WP14	Fabrication of Aluminium back stiffeners for the TDIS jaws. Component of the jaws	50k<<200k	Jun-17	High precision Assembling and manufacturing technologies	
100	TDIS prototype - Aluminium Platines	WP14	Aluminium platines for the TDIS. Precision machining is required	50k<<200k	Jul-17	High precision Assembling and manufacturing technologies	
101	TDIS prototype - Jacks	WP14	Standard Jacks for the alignment of the TDIS	50k<<200k	Aug-17	High precision Assembling and manufacturing technologies	
102	Treatments to reduce SEY and Beam induced heating	WP14	Low Secondary Electron Yield, vacuum compatible, high voltage compatible, high resistance	50k<<200k	Jun-17	High precision Assembling and manufacturing technologies	Ultra high vacuum components and systems
103	15 Ceramic Tubes	WP14	Ceramic Tubes	50k<<200k	Feb-18	High precision Assembling and manufacturing technologies	Raw Materials
104	Coating of vacuum tanks or cooling system	WP14	Coating of vacuum tanks or cooling system	50k<<200k	Feb-18	High precision Assembling and manufacturing technologies	
105	Oven controls, diesel generator	WP14	Oven controls, diesel generator	50k<<200k	Feb-18	High precision Assembling and manufacturing technologies	
106	Survey - Alignment & Internal Metrology	WP15	Acquisition of 4 laser tracker systems and software (SA). -Measurement range from 1m to 100m -Angular accuracy of better than 8ppm -Levelling accuracy of better than 1.5 arc sec -Dynamic measurement frequency of 1kHz -Possibility to trigger measurements with external signal -Compatible with Spatial Analyzer	200k<<750k	Sep-16	Others	N/A
107	WP 17 - Civil Engineering - Construction Underground and Surface for P1	WP17	CERN intends to place one or more contracts for the delivery of civil engineering works related to High Luminosity-LHC project. The works will be located in Meyrin (Switzerland) and Cessy (France). Two contracts will be established, one for Underground works 2018 to 2022 and another one for Surface works as of 2024	>750k	May-17	Civil Engineering and Technical Infrastructures	N/A
108	Civil Engineering - Construction Underground and Surface for P5	WP17	CERN intends to place one or more contracts for the delivery of civil engineering works related to High Luminosity-LHC project. The works will be located in Meyrin (Switzerland) and Cessy (France). Two contracts will be established, one for Underground works 2018 to 2022 and another one for Surface works as of 2024	>750k	May-17	Civil Engineering and Technical Infrastructures	N/A